



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-1	31263 LWRLAKEJ 115 31225 HGHLNDJ1 115 1	P1-3:A4:5: _Cortina 230/115 kV Transformer No. 4	P1	N-1	101.00	<100	<100						Explore potential mitigation
CYVL-T-2	31998 VACA-DIX 115 30460 VACA-DIX 230 3	P1-3:A4:8: _Vaca Dixon 230/115 kV Transformer No. 4	P1	N-1	119.87	<100	<100						Explore potential mitigation
CYVL-T-3	32008 SUISUN 115 31997 SCHMLBCH 115 1	P1-2:A4:41: _Vaca - Suisun 115 kV Line	P1	N-1	<100	<100	105.05						Explore potential mitigation
CYVL-T-4	32056 CORTINA 60.0 30451 CRTNA M 230 1	P1-3:A4:5: _Cortina 230/115 kV Transformer No. 4	P1	N-1	155.70	159.66	145.28						Explore potential mitigation
CYVL-T-5	32057 HUSTD 60.0 32056 CORTINA 60.0 2	P1-2:A4:42: _Cortina 60 kV Line No. 1	P1	N-1	106.01	<100	<100						Explore potential mitigation
CYVL-T-6	32057 HUSTD 60.0 32056 CORTINA 60.0 2	P1-2:A4:44: _Cortina 60 kV Line No. 1	P1	N-1	<100	111.18	113.00						Explore potential mitigation
CYVL-T-7	32073 WESCOT1 60.0 32075 WESCOT2 60.0 3	P1-2:A4:43: _Cortina No. 4 60 kV Line	P1	N-1	<100	104.24	103.66						Explore potential mitigation
CYVL-T-8	32082 PLFLDJCT 60.0 32092 PLAINFLD 60.0 1	P1-3:A4:14: _Vaca Dixon 115/60 kV Transformer No. 9	P1	N-1	100.38	<100	<100						Explore potential mitigation
CYVL-T-9	32088 VACA-DXN 60.0 31998 VACA-DIX 115 5	P1-3:A4:14: _Vaca Dixon 115/60 kV Transformer No. 9	P1	N-1	122.81	<100	<100						Explore potential mitigation
CYVL-T-10	32302 YUBACITY 60.0 32496 YCEC 13.8 1	P1-3:A5:21: _GRNLEAF2 60/13.8 kV GSU Transformer	P1	N-1	<100	109.71	<100						Explore potential mitigation
CYVL-T-11	32342 E.NICOLS 60.0 32212 E.NICOLS 115 2	P1-3:A5:11: _East Nicolaus #3 115/60 kV Transformer	P1	N-1	<100	118.93	122.76						Explore potential mitigation
CYVL-T-12	32514 ELDRADO2 21.6 32250 ELDORAD 115 1	P1-2:A5:28: _Missouri Flat - Gold Hill 115 kV No. 2 Line	P1	N-1	<100	100.72	<100						Explore potential mitigation
CYVL-T-13	32514 ELDRADO2 21.6 32250 ELDORAD 115 1	P1-2:A5:29: _Missouri Flat - Gold Hill 115 kV No. 1 Line	P1	N-1	101.48	<100	100.54						Explore potential mitigation
CYVL-T-14	33619 AMFOR_SW 60.0 33616 MARTELL 60.0 1	P1-2:A11:73: _Valley Springs-Clay 60 kV Line	P1	N-1	115.61	<100	<100						Explore potential mitigation
CYVL-T-15	33619 AMFOR_SW 60.0 33616 MARTELL 60.0 1	P1-2:A11:74: _Valley Springs-Clay 60 kV Line	P1	N-1	<100	113.07	122.39						Explore potential mitigation
CYVL-T-16	33548 TRACY 115 33550 HJ HEINZ 115 1	P2-4:A11:60: _33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-17	33562 BELLOTA 115 30500 BELLOTA 230 2	P2-4:A11:60: _33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-18	33562 BELLOTA 115 33946 RVRBK J1 115 1	P2-4:A11:60: _33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-19	33562 BELLOTA 115 33950 RVRBK TP 115 1	P2-4:A11:18: _30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	121.34	128.79						Explore potential mitigation
CYVL-T-20	33562 BELLOTA 115 33950 RVRBK TP 115 1	P2-4:A11:60: _33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-21	33610 VLLY SPS 60.0 33619 AMFOR_SW 60.0 1	P2-4:A11:69: _33610 Valley Springs 70 kV CB6222 Internal Breaker Fault	P2	Bus-tie breaker	128.48	125.74	135.75						Explore potential mitigation

Study Area: PG&E Central Valley Sacramento

Thermal Overloads



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	N/A	
CYVL-T-22	33619 AMFOR_SW 60.0 33616 MARTELL 60.0 1	P2-4:A11:69:_33610 Valley Springs 70 kV CB6222 Internal Breaker Fault	P2	Bus-tie breaker	115.48	112.97	122.30						Explore potential mitigation
CYVL-T-23	33646 MORMON 60.0 33650 WEBER 1 60.0 1	P2-3:A11:39:_30624 Tesla 230 kV Bus CB292 Internal Breaker Fault (1E and Bank #2)	P2	Bus-tie breaker	100.57	101.87	<100						Explore potential mitigation
CYVL-T-24	33646 MORMON 60.0 33650 WEBER 1 60.0 1	P2-4:A11:16:_30500 Bellota 230 kV Bus CB812 Internal Breaker Fault (1D and 1E)	P2	Bus-tie breaker	<100	101.88	106.58						Explore potential mitigation
CYVL-T-25	33717 MORADAJT 60.0 33740 MSHR 60V 60.0 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	<100	<100						Short Term: Stockton Action Plan Long Term: New Stagg - Hammer 60 kV Line
CYVL-T-26	33742 MANTECA 60.0 33514 MANTECA 115 3	P2-2:A11:57:_33528 Kasson 115 kV Bus	P2	Bus	210.71	217.92	227.48						Explore potential mitigation
CYVL-T-27	33745 LID TAP 60.0 33750 CALVO 60.0 1	P2-2:A11:57:_33528 Kasson 115 kV Bus	P2	Bus	111.56	118.12	124.11						Explore potential mitigation
CYVL-T-28	33748 MSSDLESW 60.0 33745 LID TAP 60.0 1	P2-2:A11:57:_33528 Kasson 115 kV Bus	P2	Bus	114.31	120.85	126.84						Explore potential mitigation
CYVL-T-29	33750 CALVO 60.0 33756 KASSON 60.0 1	P2-2:A11:57:_33528 Kasson 115 kV Bus	P2	Bus	106.72	113.34	119.23						Explore potential mitigation
CYVL-T-30	33766 MNTCA JT 60.0 33768 BNTA CRB 60.0 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	<100	<100						Explore potential mitigation
CYVL-T-31	33768 BNTA CRB 60.0 34003 WSID TAP 60.0 1	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	102.70	<100	<100						Explore potential mitigation
CYVL-T-32	33805 GWFTRCY1 13.8 33551 GWFTRACY 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	<100	<100						Explore potential mitigation
CYVL-T-33	33807 GWFTRCY2 13.8 33551 GWFTRACY 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	<100	<100						Explore potential mitigation
CYVL-T-34	33810 SP CMPNY 13.8 33572 SP CMPNY 115 1	P2-2:A11:63:_33551 GWF Tracy 115 kV Bus	P2	Bus	<100	104.42	<100						Explore potential mitigation
CYVL-T-35	33846 PRDE 1-3 7.20 33634 PRDESW 60.0 1	P2-4:A11:68:_33610 Valley Springs 70 kV CB6122 Internal Breaker Fault	P2	Bus-tie breaker	<100	107.48	104.30						Explore potential mitigation
CYVL-T-36	33900 DONNELLS 115 34058 DONNELLS 13.8 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	109.51	109.72						Explore potential mitigation
CYVL-T-37	33902 BRDSLY J 115 33912 SPRNG GJ 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	<100	<100						Explore potential mitigation
CYVL-T-38	33912 SPRNG GJ 115 33914 MI-WUK 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	119.39	114.55						Explore potential mitigation
CYVL-T-39	33914 MI-WUK 115 33917 FBERBORD 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	109.67	104.21						Explore potential mitigation
CYVL-T-40	33916 CURTISS 115 33917 FBERBORD 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	109.73	106.14						Explore potential mitigation



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-41	33932 MELONES 115 33934 TULLOCH 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	210.94	224.69						Explore potential mitigation
CYVL-T-42	33932 MELONES 115 33934 TULLOCH 115 1	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-43	33936 MELNS JB 115 33947 RIVRBKJT 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	122.51	116.92						Explore potential mitigation
CYVL-T-44	33947 RIVRBKJT 115 33951 VLYHMTP1 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	121.04	115.36						Explore potential mitigation
CYVL-T-45	33948 RVRBK J2 115 33953 VLYHMTP2 115 1	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-46	33950 RVRBK TP 115 33944 RVRBANK 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	119.41	126.68						Explore potential mitigation
CYVL-T-47	33951 VLYHMTP1 115 33517 RPNJN2 115 1	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	NConv	127.55	120.96						Explore potential mitigation
CYVL-T-48	33951 VLYHMTP1 115 33517 RPNJN2 115 1	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-49	34012 GUSTN JT 60.0 34014 NEWMAN 60.0 1	P2-2:A12:3:_34009 Q539SS 60 kV Bus	P2	Bus	130.01	130.03	134.45						Explore potential mitigation
CYVL-T-50	34050 CH.STN. 13.8 33928 CH.STN 115 1	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-51	31998 VACA-DIX 115 32003 VACA-D&1 115 1	P2-1:A4:49:_VACA-DIX-SCHMLBCH #1 115 kV and 99.4	P2-1	Line section w/o fault	104.17	<100	<100						Explore potential mitigation
CYVL-T-52	32008 SUISUN 115 31997 SCHMLBCH 115 1	P2-1:A4:65:_WEC-SUISUN #1 115 kV and 106.6	P2-1	Line section w/o fault	<100	<100	104.93						Explore potential mitigation
CYVL-T-53	32057 HUSTD 60.0 32056 CORTINA 60.0 2	P2-1:A4:67:_CORTINA-ARBUCKLE #1 60 kV and 29	P2-1	Line section w/o fault	145.37	<100	<100						Explore potential mitigation
CYVL-T-54	32057 HUSTD 60.0 32056 CORTINA 60.0 2	P2-1:A4:72:_CORTINA-ARBUCKLE #1 60 kV and 29	P2-1	Line section w/o fault	<100	148.64	155.37						Explore potential mitigation
CYVL-T-55	32063 ARBJCT 60.0 32061 ARBALT 60.0 2	P2-1:A4:67:_CORTINA-ARBUCKLE #1 60 kV and 29	P2-1	Line section w/o fault	116.04	<100	<100						Explore potential mitigation
CYVL-T-56	32063 ARBJCT 60.0 32061 ARBALT 60.0 2	P2-1:A4:72:_CORTINA-ARBUCKLE #1 60 kV and 29	P2-1	Line section w/o fault	<100	119.45	124.36						Explore potential mitigation
CYVL-T-57	32073 WESCOT1 60.0 32075 WESCOT2 60.0 3	P2-1:A4:83:_WILSONAV-COLUSA #1 60 kV and 29	P2-1	Line section w/o fault	<100	100.60	103.77						Explore potential mitigation



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	N/A	
CYVL-T-58	32100 DIXONPGE 60.0 32101 DIXON-J2 60.0 2	P2-1:A4:97:_VACA-DXN-VACA-JT1 #1 60 kV and 62.3	P2-1	Line section w/o fault	119.46	<100	<100						Explore potential mitigation
CYVL-T-59	32218 DRUM 115 32244 BRNSWCKP 115 2	P2-1:A5:38:_CHCGO PK-HIGGINS #1 115 kV and 64.7	P2-1	Line section w/o fault	112.70	103.78	105.53						Explore potential mitigation
CYVL-T-60	32250 ELDORAD 115 32481 APLHTAP2 115 2	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV and 64.7	P2-1	Line section w/o fault	199.23	188.19	229.38						Explore potential mitigation
CYVL-T-61	32255 PLCRVLT1 115 32261 MIZOU_T1 115 1	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV and 125.7	P2-1	Line section w/o fault	108.61	102.51	126.00						Explore potential mitigation
CYVL-T-62	32267 DIMOND_1 115 32262 SHPRING1 115 1	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV and 151.2	P2-1	Line section w/o fault	<100	<100	106.06						Short Term: Sierra Action Plan, Long Term: Gold Hill SPS and add 3rd Gold Hill 230/115 kV Transformer or Pine Hill Sub
CYVL-T-63	32302 YUBACITY 60.0 32496 YCEC 13.8 1	P2-1:A5:72:_OLIVH J1-RIO OSO #1 115 kV and 56	P2-1	Line section w/o fault	<100	111.63	99.77						Explore potential mitigation
CYVL-T-64	32302 YUBACITY 60.0 32496 YCEC 13.8 1	P2-1:A5:99:_YBA CTYJ-PEASE #1 60 kV and 56	P2-1	Line section w/o fault	<100	109.72	98.95						Explore potential mitigation
CYVL-T-65	32481 APLHTAP2 115 32257 PLCRVLT2 115 2	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV and 64.7	P2-1	Line section w/o fault	199.25	188.19	229.28						Explore potential mitigation
CYVL-T-66	32482 APLHTAP1 115 32255 PLCRVLT1 115 1	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV and 77.5	P2-1	Line section w/o fault	180.46	170.32	209.32						Explore potential mitigation
CYVL-T-67	32514 ELDRADO2 21.6 32250 ELDORAD 115 1	P2-1:A5:55:_PLCRVLT1-MIZOU_T1 #1 115 kV and 11.5	P2-1	Line section w/o fault	101.50	<100	100.57						Explore potential mitigation
CYVL-T-68	33500 MELNS JA 115 33509 AVENATP1 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 56	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-69	33506 STANISLS 115 33948 RVRBK J2 115 1	P2-4:A11:19:_BUS-TIE BREAKER FAULT AT 33540 TESLA 115.00 and 56	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-70	33509 AVENATP1 115 33514 MANTECA 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 56	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-71	33511 AVENATP2 115 33514 MANTECA 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 56	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-72	33516 RPN JNCN 115 33514 MANTECA 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 56	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-73	33516 RPN JNCN 115 33520 RIPON 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 87.6	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-74	33530 KSSN-JC2 115 33550 HJ HEINZ 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 105.2	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-75	33540 TESLA 115 33544 ELLS GTY 115 1	P2-2:A11:20:_BUS FAULT AT 33549 SCHULTE 115.00 and 164.3	P2-1	Line section w/o fault	108.48	<100	<100						Explore potential mitigation
CYVL-T-76	33540 TESLA 115 33544 ELLS GTY 115 1	P2-4:A11:20:_BUS-TIE BREAKER FAULT AT 33549 SCHULTE 115.00 and 164.3	P2-1	Line section w/o fault	108.48	<100	<100						Explore potential mitigation
CYVL-T-77	33548 TRACY 115 33550 HJ HEINZ 115 1	P2-4:A11:19:_BUS-TIE BREAKER FAULT AT 33540 TESLA 115.00 and 105.2	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-78	33562 BELLOTA 115 30500 BELLOTA 230 2	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 200	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-79	33562 BELLOTA 115 33946 RVRBK J1 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 87	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-80	33619 AMFOR_SW 60.0 33616 MARTELL 60.0 1	P2-1:A11:110:_CLAY-BUENA_TP #1 60 kV and 30.9	P2-1	Line section w/o fault	<100	113.26	122.94						Explore potential mitigation
CYVL-T-81	33646 MORMON 60.0 33650 WEBER 1 60.0 1	P2-2:A11:12:_BUS FAULT AT 30624 TESLA E 230.00 and 41.3	P2-1	Line section w/o fault	100.59	<100	<100						Explore potential mitigation
CYVL-T-82	33742 MANTECA 60.0 33514 MANTECA 115 3	P2-4:A11:19:_BUS-TIE BREAKER FAULT AT 33540 TESLA 115.00 and 31.2	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-83	33742 MANTECA 60.0 33703 LOUISJCT 60.0 1	P2-2:A11:18:_BUS FAULT AT 33528 KASSON 115.00 and 29	P2-1	Line section w/o fault	153.69	<100	<100						Explore potential mitigation
CYVL-T-84	33745 LID TAP 60.0 33750 CALVO 60.0 1	P2-2:A11:18:_BUS FAULT AT 33528 KASSON 115.00 and 35	P2-1	Line section w/o fault	111.56	<100	<100						Explore potential mitigation



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-85	33748 MSSDLESW 60.0 33745 LID TAP 60.0 1	P2-2:A11:18:_BUS FAULT AT 33528 KASSON 115.00 and 35	P2-1	Line section w/o fault	114.31	<100	<100						Explore potential mitigation
CYVL-T-86	33750 CALVO 60.0 33756 KASSON 60.0 1	P2-2:A11:18:_BUS FAULT AT 33528 KASSON 115.00 and 35	P2-1	Line section w/o fault	106.72	<100	<100						Explore potential mitigation
CYVL-T-87	33805 GWFTRCY1 13.8 33551 GWFTRACY 115 1	P2-2:A11:13:_BUS FAULT AT 30625 TESLA D 230.00 and 100	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-88	33807 GWFTRCY2 13.8 33551 GWFTRACY 115 1	P2-2:A11:13:_BUS FAULT AT 30625 TESLA D 230.00 and 100	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-89	33846 PRDE 1-3 7.20 33634 PRDESW 60.0 1	P2-1:A11:111:_INE_TP-CLAY #1 60 kV and 19	P2-1	Line section w/o fault	<100	109.40	108.22						Explore potential mitigation
CYVL-T-90	33932 MELONES 115 33500 MELNS JA 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 56	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-91	33932 MELONES 115 33934 TULLOCH 115 1	P2-2:A11:7:_BUS FAULT AT 30500 BELLOTA 230.00 and 87.6	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-92	33932 MELONES 115 33936 MELNS JB 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 56	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-93	33947 RIVRBKJT 115 33951 VLYHMTP1 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 56	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-94	33948 RVRBK J2 115 33953 VLYHMTP2 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 60.4	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-95	33950 RVRBK TP 115 33934 TULLOCH 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 87.6	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-96	33951 VLYHMTP1 115 33517 RPNJN2 115 1	P2-2:A11:19:_BUS FAULT AT 33540 TESLA 115.00 and 60.4	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation
CYVL-T-97	34016 MEDLIN J 60.0 34018 NWMN JCT 60.0 1	P2-1:A12:43:_SALADO-PATTERSN #1 60 kV and 42.7	P2-1	Line section w/o fault	98.78	101.08	102.15						Explore potential mitigation
CYVL-T-98	34050 CH.STN. 13.8 33928 CH.STN 115 1	P2-2:A11:13:_BUS FAULT AT 30625 TESLA D 230.00 and 25	P2-1	Line section w/o fault	NConv	<100	<100						Explore potential mitigation



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-99	30500 BELLOTA 230 30505 WEBER 230 1	P1-1:A11:19:_COG.NTNL 13.80 Generator ID 1 and P1-2:A11:21:_Tesla - Weber 230 kV Line	P3	G-1/N-1	<100.0	<100.0	102.11						Explore potential mitigation
CYVL-T-100	30505 WEBER 230 30624 TESLA E 230 1	P1-1:A11:19:_COG.NTNL 13.80 Generator ID 1 and P1-2:A11:17:_Bellota - Weber 230 kV Line	P3	G-1/N-1	<100.0	<100.0	103.01						Explore potential mitigation
CYVL-T-101	31998 VACA-DIX 115 30460 VACA-DIX 230 3	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-3:A4:8:_Vaca Dixon 230/115 kV Transformer No. 4	P3	G-1/N-1	119.88	<100.0	<100.0						Explore potential mitigation
CYVL-T-102	31998 VACA-DIX 115 31997 SCHMLBCH 115 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:38:_Vaca - Suisun 115 kV Line	P3	G-1/N-1	103.37	<100.0	<100.0						Explore potential mitigation
CYVL-T-103	31998 VACA-DIX 115 31997 SCHMLBCH 115 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:41:_Vaca - Suisun 115 kV Line	P3	G-1/N-1	<100.0	114.56	123.65						Explore potential mitigation
CYVL-T-104	32008 SUISUN 115 31997 SCHMLBCH 115 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:41:_Vaca - Suisun 115 kV Line	P3	G-1/N-1	<100.0	<100.0	105.33						Explore potential mitigation
CYVL-T-105	32056 CORTINA 60.0 30451 CRTNA M 230 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-3:A4:5:_Cortina 230/115 kV Transformer No. 4	P3	G-1/N-1	155.70	137.08	123.28						Explore potential mitigation
CYVL-T-106	32057 HUSTD 60.0 32056 CORTINA 60.0 2	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:42:_Cortina 60 kV Line No. 1	P3	G-1/N-1	106.01	<100.0	<100.0						Explore potential mitigation
CYVL-T-107	32057 HUSTD 60.0 32056 CORTINA 60.0 2	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:44:_Cortina 60 kV Line No. 1	P3	G-1/N-1	<100.0	114.10	116.13						Explore potential mitigation
CYVL-T-108	32070 CLSA JCT 60.0 32073 WESCOT1 60.0 3	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:43:_Cortina No. 4 60 kV Line	P3	G-1/N-1	<100.0	106.89	106.36						Explore potential mitigation
CYVL-T-109	32073 WESCOT1 60.0 32075 WESCOT2 60.0 3	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:43:_Cortina No. 4 60 kV Line	P3	G-1/N-1	<100.0	106.90	106.36						Explore potential mitigation
CYVL-T-110	32088 VACA-DXN 60.0 31998 VACA-DIX 115 5	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-3:A4:14:_Vaca Dixon 115/60 kV Transformer No. 9	P3	G-1/N-1	122.81	<100.0	<100.0						Explore potential mitigation
CYVL-T-111	32342 E.NICOLS 60.0 32212 E.NICOLS 115 2	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-3:A5:11:_East Nicolaus #3 115/60 kV Transformer	P3	G-1/N-1	<100.0	118.94	122.75						Explore potential mitigation
CYVL-T-112	32374 DRUM 60.0 32376 BONNIE N 60.0 1	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1 and P1-2:A5:54:_Colgate-Grass Valley 60 kV Line	P3	G-1/N-1	103.16	104.03	110.72						Explore potential mitigation



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-113	32376 BONNIE N 60.0 32367 CPEHRNTP 60.0 1	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1 and P1-2:A5:54:_Colgate-Grass Valley 60 kV Line	P3	G-1/N-1	<100.0	<100.0	102.92						Explore potential mitigation
CYVL-T-114	33540 TESLA 115 33541 AEC_TP1 115 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A11:53:_Tesla - Schulte 115 kV Line No. 2	P3	G-1/N-1	102.07	<100.0	<100.0						Explore potential mitigation
CYVL-T-115	33610 VLLY SPS 60.0 33619 AMFOR_SW 60.0 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A11:73:_Valley Springs-Clay 60 kV Line	P3	G-1/N-1	128.62	<100.0	<100.0						Explore potential mitigation
CYVL-T-116	33610 VLLY SPS 60.0 33619 AMFOR_SW 60.0 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A11:74:_Valley Springs-Clay 60 kV Line	P3	G-1/N-1	<100.0	125.89	<100.0						Explore potential mitigation
CYVL-T-117	33619 AMFOR_SW 60.0 33616 MARTELL 60.0 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A11:73:_Valley Springs-Clay 60 kV Line	P3	G-1/N-1	115.61	<100.0	<100.0						Explore potential mitigation
CYVL-T-118	33619 AMFOR_SW 60.0 33616 MARTELL 60.0 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A11:74:_Valley Springs-Clay 60 kV Line	P3	G-1/N-1	<100.0	113.10	<100.0						Explore potential mitigation
CYVL-T-119	33636 N.HGN JT 60.0 33640 CORRAL 60.0 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A11:76:_Weber - Mormon Jct 60 kV Line	P3	G-1/N-1	106.57	<100.0	<100.0						Explore potential mitigation
CYVL-T-120	33636 N.HGN JT 60.0 33640 CORRAL 60.0 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A11:77:_Weber - Mormon Jct 60 kV Line	P3	G-1/N-1	<100.0	106.61	114.20						Explore potential mitigation
CYVL-T-121	33662 WEBER 2 60.0 33674 HAZLTN J 60.0 1	P1-1:A11:19:_COG.NTNL 13.80 Generator ID 1 and P1-2:A11:82:_Stockton 'A' - Weber 60 kV Line No. 2	P3	G-1/N-1	<100.0	<100.0	112.86						Explore potential mitigation
CYVL-T-122	33805 GWFTRCY1 13.8 33551 GWFTRACY 115 1	P1-1:A11:11:_GWFTRCY3 13.80 Generator ID 1 and P1-2:A11:5:_Tesla - Vierra 115 kV Line	P3	G-1/N-1	<100.0	<100.0	102.32						Explore potential mitigation
CYVL-T-123	33900 DONNELLS 115 34058 DONNELLS 13.8 1	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line	P3	G-1/N-1	101.62	<100.0	<100.0						Explore potential mitigation
CYVL-T-124	33936 MELNS JB 115 33947 RIVRBKJT 115 1	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P3	G-1/N-1	<100.0	<100.0	101.22						Explore potential mitigation
CYVL-T-125	34002 SALADO 60.0 34008 STNSLSRP 60.0 1	P1-1:A12:4:_Q539 34.50 Generator ID 1 and P1-2:A12:16:_Salado - Newman 60 kV Line No. 2	P3	G-1/N-1	<100.0	100.10	<100.0						Explore potential mitigation



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-126	34008 STNSLSRP 60.0 34009 Q539SS 60.0 1	P1-1:A12:4:_Q539 34.50 Generator ID 1 and P1-2:A12:16:_Salado - Newman 60 kV Line No. 2	P3	G-1/N-1	100.14	100.30	101.10						Explore potential mitigation
CYVL-T-127	34009 Q539SS 60.0 34016 MEDLIN J 60.0 1	P1-1:A11:11:_GWFTRCY3 13.80 Generator ID 1 and P1-2:A12:16:_Salado - Newman 60 kV Line No. 2	P3	G-1/N-1	<100.0	100.93	101.87						Explore potential mitigation
CYVL-T-128	34009 Q539SS 60.0 34016 MEDLIN J 60.0 1	P1-1:A12:4:_Q539 34.50 Generator ID 1 and P1-2:A12:16:_Salado - Newman 60 kV Line No. 2	P3	G-1/N-1	100.13	100.30	101.10						Explore potential mitigation
CYVL-T-129	34012 GUSTN JT 60.0 34014 NEWMAN 60.0 1	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A12:17:_Salado-S539SS #1 60 kV Line	P3	G-1/N-1	<100.0	111.61	118.36						Explore potential mitigation
CYVL-T-130	31116 GRBRVLE 60.0 31118 KEKAWAKA 60.0 1	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<100.0	101.35	100.96						Explore potential mitigation
CYVL-T-131	31118 KEKAWAKA 60.0 31308 LYTNVLE 60.0 1	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<100.0	101.27	100.86						Explore potential mitigation
CYVL-T-132	31220 EGLE RCK 115 31228 HOMSTKTP 115 1	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<100.0	107.60	<100.0						Explore potential mitigation
CYVL-T-133	31263 LWRLAKEJ 115 31225 HGHLNDJ1 115 1	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<100.0	132.05	120.95						Explore potential mitigation
CYVL-T-134	31640 TRES VIS 60.0 31644 BIGGSJCT 60.0 1	P1-2:A5:31:_Palermo - Pease 115 kV Line and P1-2:A5:32:_Pease - Rio Oso 115 kV Line	P6	N-1/N-1	<100.0	NConv	<100.0						Explore potential mitigation
CYVL-T-135	31642 PEACHTON 60.0 31644 BIGGSJCT 60.0 1	P1-2:A5:31:_Palermo - Pease 115 kV Line and P1-2:A5:32:_Pease - Rio Oso 115 kV Line	P6	N-1/N-1	<100.0	NConv	<100.0						Explore potential mitigation
CYVL-T-136	31962 WDLND_BM 115 31970 WOODLD 115 1	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	155.55	<100.0	<100.0						Explore potential mitigation
CYVL-T-137	31964 KNIGHT2 115 31968 WODLNDJ2 115 2	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	102.21	<100.0	<100.0						Explore potential mitigation
CYVL-T-138	31984 BRIGHTN 115 31993 BRKRJCT 115 1	P1-2:A4:29:_Woodland - Davis 115 kV Line and P1-2:A4:32:_West Sacramento - Brighton 115 kV Line	P6	N-1/N-1	139.02	<100.0	<100.0						Explore potential mitigation



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-139	31993 BRKRJCT 115 32001 UCD_TP2 115 1	P1-2:A4:32:_West Sacramento - Brighton 115 kV Line and P1-2:A4:29:_Woodland - Davis 115 kV Line	P6	N-1/N-1	137.65	<100.0	<100.0						Short Term: Sierra Action Plan, Long Term: South of Palermo 115 kV Reinforcement Project and Rio Oso 230 kV BAAH Conversion
CYVL-T-140	31998 VACA-DIX 115 30460 VACA-DIX 230 3	P1-3:A4:16:_Vaca Dixon 230/115 kV Transformer No. 2 and P1-3:A4:8:_Vaca Dixon 230/115 kV Transformer No. 4	P6	N-1/N-1	<100.0	111.38	117.57						Explore potential mitigation
CYVL-T-141	31998 VACA-DIX 115 30460 VACA-DIX 230 3	P1-3:A4:17:_Cortina #5 115/60 kV Transformer and P1-3:A4:8:_Vaca Dixon 230/115 kV Transformer No. 4	P6	N-1/N-1	119.88	<100.0	<100.0						Explore potential mitigation
CYVL-T-142	31998 VACA-DIX 115 31997 SCHMLBCH 115 1	P1-2:A11:28:_Delta Switching Yard - Tesla 230 kV Line and P1-2:A4:38:_Vaca - Suisun 115 kV Line	P6	N-1/N-1	103.39	<100.0	<100.0						Explore potential mitigation
CYVL-T-143	31998 VACA-DIX 115 31997 SCHMLBCH 115 1	P1-2:A11:28:_Delta Switching Yard - Tesla 230 kV Line and P1-2:A4:41:_Vaca - Suisun 115 kV Line	P6	N-1/N-1	<100.0	114.62	123.68						Explore potential mitigation
CYVL-T-144	32001 UCD_TP2 115 31990 DAVIS 115 1	P1-2:A4:29:_Woodland - Davis 115 kV Line and P1-2:A4:32:_West Sacramento - Brighton 115 kV Line	P6	N-1/N-1	111.32	<100.0	<100.0						Short Term: Sierra Action Plan, Long Term: South of Palermo 115 kV Reinforcement Project and Rio Oso 230 kV BAAH Conversion
CYVL-T-145	32008 SUISUN 115 31997 SCHMLBCH 115 1	P1-4:A5:3:_GOLDHILL 115.00 SVD ID v and P1-2:A4:41:_Vaca - Suisun 115 kV Line	P6	N-1/N-1	<100.0	<100.0	105.37						Explore potential mitigation
CYVL-T-146	32018 GOLDHILL 115 32231 HORSHE2 115 2	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	108.46	106.36	108.18						Explore potential mitigation
CYVL-T-147	32056 CORTINA 60.0 32065 WILL JCT 60.0 4	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<100.0	112.06	<100.0						Explore potential mitigation
CYVL-T-148	32065 WILL JCT 60.0 32055 MAXTAP 60.0 4	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<100.0	112.11	<100.0						Explore potential mitigation
CYVL-T-149	32082 PLFLDJCT 60.0 32090 WINTERS 60.0 1	P1-3:A4:14:_Vaca Dixon 115/60 kV Transformer No. 9 and P1-3:A4:7:_Vaca Dixon 230/115 kV Transformer No. 3	P6	N-1/N-1	103.81	<100.0	<100.0						Explore potential mitigation
CYVL-T-150	32082 PLFLDJCT 60.0 32092 PLAINFLD 60.0 1	P1-3:A4:14:_Vaca Dixon 115/60 kV Transformer No. 9 and P1-3:A4:7:_Vaca Dixon 230/115 kV Transformer No. 3	P6	N-1/N-1	104.74	<100.0	<100.0						Explore potential mitigation



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-151	32174 GOOSEHGT 13.8 30478 LAMBIE 230 1	P1-3:A4:1:_Vaca-Dixon No. 11 500/230 kV Transformer Tertiary and P1-3:A4:2:_Vaca-Dixon No. 12 500/230 kV Transformer Tertiary	P6	N-1/N-1	<100.0	101.12	101.25						Explore potential mitigation
CYVL-T-152	32185 WOLFSKIL 13.8 32011 WEC 115 1	P1-3:A4:8:_Vaca Dixon 230/115 kV Transformer No. 4 and P1-3:A4:7:_Vaca Dixon 230/115 kV Transformer No. 3	P6	N-1/N-1	<100.0	100.45	100.45						Explore potential mitigation
CYVL-T-153	32214 RIO OSO 115 31964 KNIGHT2 115 2	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	102.20	<100.0	<100.0						Explore potential mitigation
CYVL-T-154	32214 RIO OSO 115 31986 W.SCRMNO 115 1	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	139.76	<100.0	<100.0						Explore potential mitigation
CYVL-T-155	32214 RIO OSO 115 32244 BRNSWCKP 115 2	P1-2:A5:43:_Higgins - Bell 115 kV Line and P1-2:A5:39:_Drum - Rio Oso 115 kV No. 1 Line	P6	N-1/N-1	108.30	<100.0	<100.0						Explore potential mitigation
CYVL-T-156	32214 RIO OSO 115 32244 BRNSWCKP 115 2	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	<100.0	108.75	<100.0						Explore potential mitigation
CYVL-T-157	32218 DRUM 115 32220 DTCH FL1 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	217.34	152.64	175.36						Explore potential mitigation
CYVL-T-158	32218 DRUM 115 32244 BRNSWCKP 115 2	P1-2:A5:41:_Drum - Higgins 115 kV Line and P1-2:A5:39:_Drum - Rio Oso 115 kV No. 1 Line	P6	N-1/N-1	125.65	100.22	100.37						Explore potential mitigation
CYVL-T-159	32220 DTCH FL1 115 32224 CHCGO PK 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	133.91	<100.0	110.82						Explore potential mitigation
CYVL-T-160	32224 CHCGO PK 115 32232 HIGGINS 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	158.04	123.65	135.81						Explore potential mitigation
CYVL-T-161	32225 BRNSWKTP 115 32222 DTCH FL2 115 1	P1-2:A5:41:_Drum - Higgins 115 kV Line and P1-2:A5:40:_Drum - Rio Oso 115 kV No. 2 Line	P6	N-1/N-1	133.05	100.71	100.79						Explore potential mitigation
CYVL-T-162	32228 PLACER 115 32238 BELL PGE 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	118.55	<100.0	90.99						Explore potential mitigation
CYVL-T-163	32228 PLACER 115 32239 FLINT2 115 2	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	115.31	113.88	115.91						Explore potential mitigation



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-164	32228 PLACER WISE 115 32512 12.0 1	P1-2:A11:44:_Schulte Sw Sta - Kasson - Manteca 115 kV Line and P1-2:A5:43:_Higgins - Bell 115 kV Line	P6	N-1/N-1	<100.0	102.66	101.97						Explore potential mitigation
CYVL-T-165	32229 HORSHE1 NEWCSTL1 115 32233 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	128.47	127.67	131.41						Explore potential mitigation
CYVL-T-166	32232 HIGGINS BELL PGE 115 32238 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	130.93	<100.0	107.58						Explore potential mitigation
CYVL-T-167	32233 NEWCSTL1 FLINT1 115 32236 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	124.31	117.49	121.12						Explore potential mitigation
CYVL-T-168	32235 NEWCSTL2 FLINT2 115 32239 115 2	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	108.28	106.13	107.73						Explore potential mitigation
CYVL-T-169	32236 FLINT1 PLACER 115 32228 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	124.26	117.42	121.06						Explore potential mitigation
CYVL-T-170	32302 YUBACITY YCEC 60.0 32496 13.8 1	P1-3:A11:13:_Belltoa 230/115 kV Transformer No. 2 and P1-3:A11:12:_Bellota 230/115 kV Transformer No. 1	P6	N-1/N-1	<100.0	NConv	<100.0						Explore potential mitigation
CYVL-T-171	32326 ENCL TAP PEASE 60.0 32332 60.0 1	P1-2:A5:32:_Pease - Rio Oso 115 kV Line and P1-2:A5:31:_Palermo - Pease 115 kV Line	P6	N-1/N-1	NConv	<100.0	<100.0						Explore potential mitigation
CYVL-T-172	32326 ENCL TAP PEASE 60.0 32332 60.0 1	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	135.66	<100.0	<100.0						Explore potential mitigation
CYVL-T-173	32342 E.NICOLS E.NICOLS 60.0 32212 115 2	P1-2:A5:66:_Smartville - Nicolaus #1 60 kV Line and P1-3:A5:11:_East Nicolaus #3 115/60 kV Transformer	P6	N-1/N-1	100.05	120.29	123.14						Explore potential mitigation
CYVL-T-174	32412 ATLANTIC PLACER 115 32228 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	162.22	169.73	175.28						Explore potential mitigation
CYVL-T-175	32450 COLGATE1 COLGATE 13.8 30327 230 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	<100.0	101.21	<100.0						Explore potential mitigation
CYVL-T-176	32458 RALSTON RALSTON 13.8 30340 230 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	<100.0	101.83	101.84						Explore potential mitigation



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-177	32460 NEWCASTLE 13.2 32234 NEWCASTLE 115 1	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	<100.0	104.36	103.96						Explore potential mitigation
CYVL-T-178	32462 CHI.PARK 11.5 32224 CHCGO PK 115 1	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	<100.0	103.91	103.86						Explore potential mitigation
CYVL-T-179	32508 FRNCH MD 4.16 32388 FRNCH MS 60.0 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	<100.0	101.77	101.74						Explore potential mitigation
CYVL-T-180	32513 ELDRADO1 21.6 32250 ELDORAD 115 1	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	108.06	107.71	106.98						Explore potential mitigation
CYVL-T-181	32514 ELDRADO2 21.6 32250 ELDORAD 115 1	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	108.06	107.39	107.20						Explore potential mitigation
CYVL-T-182	33504 CATARACT 115 33503 FRGTNTP2 115 1	P1-2:A11:3:_Stanislaus - Manteca 115 kV Line No. 2 and P1-2:A11:41:_Stanislaus-Melones-Manteca 115 kV Line No. 1	P6	N-1/N-1	110.67	<100.0	<100.0						Explore potential mitigation
CYVL-T-183	33506 STANISLS 115 33501 FRGTNTP1 115 1	P1-2:A11:2:_Stanislaus-Melones-Riverbank Jct 115 kV Line and P1-2:A11:3:_Stanislaus - Manteca 115 kV Line No. 2	P6	N-1/N-1	110.54	<100.0	<100.0						Explore potential mitigation
CYVL-T-184	33506 STANISLS 115 33504 CATARACT 115 1	P1-2:A11:3:_Stanislaus - Manteca 115 kV Line No. 2 and P1-2:A11:41:_Stanislaus-Melones-Manteca 115 kV Line No. 1	P6	N-1/N-1	110.68	<100.0	<100.0						Explore potential mitigation
CYVL-T-185	33506 STANISLS 115 33948 RVRBK J2 115 1	P1-2:A11:2:_Stanislaus-Melones-Riverbank Jct 115 kV Line and P1-2:A11:41:_Stanislaus-Melones-Manteca 115 kV Line No. 1	P6	N-1/N-1	110.55	<100.0	<100.0						Explore potential mitigation
CYVL-T-186	33514 MANTECA 115 33526 KSSN-JC1 115 1	P1-2:A11:51:_Tesla - Vierra 115 kV Line and P1-2:A11:49:_Vierra - Tracy - Kasson 115 kV Line	P6	N-1/N-1	<100.0	101.40	101.24						Explore potential mitigation
CYVL-T-187	33516 RPN JNCN 115 33514 MANTECA 115 1	P1-3:A11:13:_Belltoa 230/115 kV Transformer No. 2 and P1-3:A11:12:_Bellota 230/115 kV Transformer No. 1	P6	N-1/N-1	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-188	33526 KSSN-JC1 115 33528 KASSON 115 1	P1-2:A11:59:_Schulte - Lammers 115 kV Line and P1-2:A11:55:_Tesla - Tracy 115 kV Line	P6	N-1/N-1	111.43	109.12	119.22						Explore potential mitigation
CYVL-T-189	33533 OWENSTP2 115 33526 KSSN-JC1 115 1	P1-2:A11:5:_Tesla - Vierra 115 kV Line and P1-2:A11:59:_Schulte - Lammers 115 kV Line	P6	N-1/N-1	<100.0	105.21	106.94						Explore potential mitigation

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ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-190	33537 SFWY_TP1 115 33549 SCHULTE 115 1	P1-2:A11:55:_Tesla - Tracy 115 kV Line and P1-2:A11:53:_Tesla - Schulte 115 kV Line No. 2	P6	N-1/N-1	108.20	<100.0	<100.0						Explore potential mitigation
CYVL-T-191	33540 TESLA 115 33543 AEC_TP2 115 1	P1-2:A11:51:_Tesla - Vierra 115 kV Line and P1-2:A11:54:_Tesla - Schulte 115 kV Line No. 1	P6	N-1/N-1	134.04	<100.0	<100.0						Explore potential mitigation
CYVL-T-192	33540 TESLA 115 33544 ELLS GTY 115 1	P1-2:A11:44:_Schulte Sw Sta - Kasson - Manteca 115 kV Line and P1-2:A11:59:_Schulte - Lammers 115 kV Line	P6	N-1/N-1	108.78	101.49	108.02						Explore potential mitigation
CYVL-T-193	33542 LEPRINO 115 33546 TRACY JC 115 1	P1-2:A11:44:_Schulte Sw Sta - Kasson - Manteca 115 kV Line and P1-2:A11:59:_Schulte - Lammers 115 kV Line	P6	N-1/N-1	106.81	<100.0	106.08						Explore potential mitigation
CYVL-T-194	33542 LEPRINO 115 33548 TRACY 115 1	P1-2:A11:44:_Schulte Sw Sta - Kasson - Manteca 115 kV Line and P1-2:A11:59:_Schulte - Lammers 115 kV Line	P6	N-1/N-1	137.41	128.06	136.52						Explore potential mitigation
CYVL-T-195	33549 SCHULTE 115 33533 OWENSTP2 115 2	P1-2:A11:51:_Tesla - Vierra 115 kV Line and P1-2:A11:59:_Schulte - Lammers 115 kV Line	P6	N-1/N-1	<100.0	105.12	106.85						Explore potential mitigation
CYVL-T-196	33558 LCKFRDJB 115 33562 BELLOTA 115 1	P1-2:A11:62:_Stockton 'A' - Lockeford - Bellota 115 kV Line No. 1 and P1-2:A11:63:_Gold Hill-Bellota-Lockeford 115 kV Line	P6	N-1/N-1	<100.0	102.23	110.59						Explore potential mitigation
CYVL-T-197	33562 BELLOTA 115 33950 RVRBK TP 115 1	P1-3:A11:12:_Bellota 230/115 kV Transformer No. 1 and P1-3:A11:13:_Belltoa 230/115 kV Transformer No. 2	P6	N-1/N-1	<100.0	NConv	NConv						Explore potential mitigation
CYVL-T-198	33662 WEBER 2 60.0 33654 SNTA FEA 60.0 1	P1-2:A11:82:_Stockton 'A' - Weber 60 kV Line No. 2 and P1-2:A11:83:_Stockton 'A' - Weber 60 kV Line No. 3	P6	N-1/N-1	<100.0	101.16	<100.0						Explore potential mitigation
CYVL-T-199	33662 WEBER 2 60.0 33674 HAZLTN J 60.0 1	P1-2:A11:82:_Stockton 'A' - Weber 60 kV Line No. 2 and P1-2:A11:81:_Stockton 'A' - Weber 60 kV Line No. 1	P6	N-1/N-1	<100.0	173.52	129.05						Explore potential mitigation
CYVL-T-200	33674 HAZLTN J 60.0 33670 STCKTN A 60.0 1	P1-2:A11:80:_Stockton 'A' - Weber 60 kV Line No. 1 and P1-2:A11:81:_Stockton 'A' - Weber 60 kV Line No. 2	P6	N-1/N-1	148.81	<100.0	<100.0						Explore potential mitigation
CYVL-T-201	33674 HAZLTN J 60.0 33670 STCKTN A 60.0 1	P1-2:A11:81:_Stockton 'A' - Weber 60 kV Line No. 1 and P1-2:A11:82:_Stockton 'A' - Weber 60 kV Line No. 2	P6	N-1/N-1	<100.0	159.50	<100.0						Explore potential mitigation
CYVL-T-202	33706 CNTRY CB 60.0 33708 UOP 60.0 1	P1-2:A11:89:_New Stagg - Hammer 60 kV Line No. 2 and P1-2:A11:88:_Stagg - Hammer 60 kV Line No. 1	P6	N-1/N-1	102.26	<100.0	<100.0						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	N/A	
CYVL-T-203	33706 CNTRY CB 60.0 33708 UOP 60.0 1	P1-2:A11:89:_Stagg - Hammer 60 kV Line No. 1 and P1-2:A11:90:_New Stagg - Hammer 60 kV Line No. 2	P6	N-1/N-1	<100.0	104.55	113.32						Explore potential mitigation
CYVL-T-204	33714 HAMMER 60.0 33716 HMMR JCT 60.0 1	P1-2:A11:86:_Stagg - Country Club 60 kV Line No. 1 and P1-2:A11:87:_Stagg - Country Club 60 kV Line No. 2	P6	N-1/N-1	107.59	<100.0	<100.0						Explore potential mitigation
CYVL-T-205	33714 HAMMER 60.0 33716 HMMR JCT 60.0 1	P1-2:A11:87:_Stagg - Country Club 60 kV Line No. 1 and P1-2:A11:88:_Stagg - Country Club 60 kV Line No. 2	P6	N-1/N-1	<100.0	109.22	118.53						Explore potential mitigation
CYVL-T-206	33810 SP CMPNY 13.8 33572 SP CMPNY 115 1	P1-2:A11:44:_Schulte Sw Sta - Kasson - Manteca 115 kV Line and P1-2:A11:2:_Stanislaus-Melones-Riverbank Jct 115 kV Line	P6	N-1/N-1	<100.0	104.75	103.88						Explore potential mitigation
CYVL-T-207	33846 PRDE 1-3 7.20 33634 PRDESW 60.0 1	P1-3:A11:12:_Bellota 230/115 kV Transformer No. 1 and P1-3:A11:13:_Belltoa 230/115 kV Transformer No. 2	P6	N-1/N-1	<100.0	NConv	NConv						Explore potential mitigation
CYVL-T-208	33904 BEARDSLY 115 34074 BEARDSLY 6.90 1	P1-3:A11:13:_Belltoa 230/115 kV Transformer No. 2 and P1-3:A11:12:_Bellota 230/115 kV Transformer No. 1	P6	N-1/N-1	<100.0	NConv	NConv						Explore potential mitigation
CYVL-T-209	33932 MELONES 115 33500 MELNS JA 115 1	P1-3:A11:12:_Bellota 230/115 kV Transformer No. 1 and P1-3:A11:13:_Belltoa 230/115 kV Transformer No. 2	P6	N-1/N-1	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-210	33936 MELNS JB 115 33947 RIVRBKJT 115 1	P1-3:A11:18:_Tesla 230/115 kV Transformer No. 1 and P1-3:A11:19:_Tesla 230/115 kV Transformer No. 3	P6	N-1/N-1	NConv	<100.0	<100.0						Explore potential mitigation
CYVL-T-211	33948 RVRBK J2 115 33953 VLYHMTP2 115 1	P1-2:A12:12:_Stanislaus-Melones-Manteca 115 kV Line No. 1 and P1-2:A11:42:_Stanislaus-Melones-Riverbank Jct 115 kV Line	P6	N-1/N-1	105.54	<100.0	<100.0						Explore potential mitigation
CYVL-T-212	33950 RVRBK TP 115 33934 TULLOCH 115 1	P1-3:A11:12:_Bellota 230/115 kV Transformer No. 1 and P1-3:A11:13:_Belltoa 230/115 kV Transformer No. 2	P6	N-1/N-1	NConv	NConv	NConv						Explore potential mitigation
CYVL-T-213	33953 VLYHMTP2 115 33511 AVENATP2 115 1	P1-2:A11:2:_Stanislaus-Melones-Riverbank Jct 115 kV Line and P1-2:A11:41:_Stanislaus-Melones-Manteca 115 kV Line No. 1	P6	N-1/N-1	105.49	<100.0	<100.0						Explore potential mitigation



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-214	34008 STNSLSRP 60.0 34009 Q539SS 60.0 1	P1-2:A12:18:_Q539SS-Q539 60 kV Line and P1-2:A12:16:_Salado - Newman 60 kV Line No. 2	P6	N-1/N-1	100.14	100.31	101.10						Explore potential mitigation
CYVL-T-215	34009 Q539SS 60.0 34016 MEDLIN J 60.0 1	P1-2:A11:58:_Tesla - Salado 115 kV Line No. 1 and P1-2:A12:16:_Salado - Newman 60 kV Line No. 2	P6	N-1/N-1	100.14	103.42	102.31						Explore potential mitigation
CYVL-T-216	34060 SANDBAR 13.8 33908 SANDBAR 115 1	P1-3:A11:12:_Bellota 230/115 kV Transformer No. 1 and P1-3:A11:13:_Belltoa 230/115 kV Transformer No. 2	P6	N-1/N-1	<100.0	NConv	NConv						Explore potential mitigation
CYVL-T-217	37649 LLNLAB 115 33574 LLNL TAP 115 1	P1-3:A11:18:_Tesla 230/115 kV Transformer No. 1 and P1-3:A11:19:_Tesla 230/115 kV Transformer No. 3	P6	N-1/N-1	NConv	<100.0	<100.0						Explore potential mitigation
CYVL-T-218	38054 GRIDLEY 60.0 32334 LIVE OAK 60.0 1	P1-2:A5:31:_Palermo - Pease 115 kV Line and P1-2:A5:32:_Pease - Rio Oso 115 kV Line	P6	N-1/N-1	NConv	<100.0	<100.0						Explore potential mitigation
CYVL-T-219	31263 LWRLAKEJ 115 31225 HGHLNDJ1 115 1	P7-1:A4:5_Logan Creek-Delevan 230 kV Line & Delevan-Cortina 230 kV Line and 41.6	P7	DCTL	100.46	<100.0	<100.0						Explore potential mitigation
CYVL-T-220	31610 TYLER 60.0 31603 CANAL TP 60.0 2	P7-1:A4:18_Glenn-Delevan 230 kV Line & Cottonwood(F)-New Bus 230 kV Line and 30.9	P7	DCTL	<100.0	109.60	108.75						Explore potential mitigation
CYVL-T-221	31640 TRES VIS 60.0 31644 BIGGSJCT 60.0 1	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line and 65.6	P7	DCTL	NConv	NConv	<100.0						Explore potential mitigation
CYVL-T-222	31642 PEACHTON 60.0 31644 BIGGSJCT 60.0 1	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line and 65.6	P7	DCTL	NConv	NConv	<100.0						Explore potential mitigation
CYVL-T-223	31962 WDLND_BM 115 31970 WOODLD 115 1	P7-1:A5:15_Rio Oso-Woodland No. 1 115 kV Line & Rio Oso-Woodland No. 2 115 kV Line and 119.5	P7	DCTL	105.92	<100.0	<100.0						Explore potential mitigation
CYVL-T-224	31962 WDLND_BM 115 31990 DAVIS 115 1	P7-1:A4:17_Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line and 119.5	P7	DCTL	110.87	<100.0	<100.0						Explore potential mitigation
CYVL-T-225	31980 DPWTR_TP 115 31986 W.SCRMNO 115 1	P7-1:A4:16_Rio Oso-Woodland #1 115 kV Line & Rio Oso-Woodland #2 115 kV Line and 125.7	P7	DCTL	101.90	<100.0	<100.0						Explore potential mitigation
CYVL-T-226	31980 DPWTR_TP 115 31990 DAVIS 115 1	P7-1:A5:15_Rio Oso-Woodland No. 1 115 kV Line & Rio Oso-Woodland No. 2 115 kV Line and 125.7	P7	DCTL	100.19	<100.0	<100.0						Explore potential mitigation
CYVL-T-227	31984 BRIGHTN 115 31993 BRKRJCT 115 1	P7-1:A4:17_Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line and 89.4	P7	DCTL	125.04	<100.0	<100.0						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-T-228	32302 YUBACITY 60.0 32496 YCEC 13.8 1	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line and 56	P7	DCTL	NConv	NConv	102.54						Explore potential mitigation
CYVL-T-229	33504 CATARACT 115 33503 FRGTNTP2 115 1	P7-1:A12:18:_Stanislaus-Melones-Manteca No.1 115 kV & Stanislaus-Manteca No.2 115 kV Lines and 56	P7	DCTL	110.67	110.96	109.51						Explore potential mitigation
CYVL-T-230	33506 STANISLS 115 33501 FRGTNTP1 115 1	P7-1:A12:14:_Stanislaus-Manteca No.2 115 kV & Stanislaus-Melones-Riverbank Jct 115 kV Lines and 56	P7	DCTL	110.54	111.04	109.68						Explore potential mitigation
CYVL-T-231	33506 STANISLS 115 33504 CATARACT 115 1	P7-1:A12:18:_Stanislaus-Melones-Manteca No.1 115 kV & Stanislaus-Manteca No.2 115 kV Lines and 56	P7	DCTL	110.68	110.99	109.56						Explore potential mitigation
CYVL-T-232	33542 LEPRINO 115 33548 TRACY 115 1	P7-1:A12:19:_Tesla-Schulte 115 kV Line No. 1 & Tesla-Schulte 115 kV Line No. 2 and 125.7	P7	DCTL	138.60	<100.0	<100.0						Explore potential mitigation
CYVL-T-233	33646 MORMON 60.0 33650 WEBER 1 60.0 1	P7-1:A12:6_Bellota-Tesla 230 kV Line & Bellota-Weber 230 kV Line and 41.3	P7	DCTL	100.38	101.68	106.41						Explore potential mitigation
CYVL-T-234	33810 SP CMPNY 13.8 33572 SP CMPNY 115 1	P7-1:A12:21:_Schulte-Kasson-Manteca 115 kV Line & Tesla-Salado-Manteca 115 kV Line and 54	P7	DCTL	<100.0	102.65	103.02						Explore potential mitigation
CYVL-T-235	33846 PRDE 1-3 7.20 33634 PRDESWS 60.0 1	P7-1:A12:25:_Valley Springs-Martell No.1 & Clay-Martell 60 kV Lines and 19	P7	DCTL	<100.0	108.21	108.20						Explore potential mitigation
CYVL-T-236	38054 GRIDLEY 60.0 32334 LIVE OAK 60.0 1	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line and 62.4	P7	DCTL	NConv	NConv	<100.0						Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-1	ALMENDRA 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer	P1	N-1	6.061	<5.0	<5.0					Explore potential mitigation
CYVL-VD-2	ENCINAL 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer	P1	N-1	5.191	<5.0	<5.0					Explore potential mitigation
CYVL-VD-3	ENVRO_HY 60 kV	P1-1:A5:26:_OXBOW F 9.11 Generator ID 1	P1	N-1	6.567	6.56	6.683					Explore potential mitigation
CYVL-VD-4	FORST HL 60 kV	P1-1:A5:26:_OXBOW F 9.11 Generator ID 1	P1	N-1	5.833	5.828	5.945					Explore potential mitigation
CYVL-VD-5	HARTER 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer	P1	N-1	6.15	<5.0	<5.0					Explore potential mitigation
CYVL-VD-6	MRYSVLE 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer	P1	N-1	6.138	<5.0	<5.0					Explore potential mitigation
CYVL-VD-7	OXBOW 60 kV	P1-1:A5:26:_OXBOW F 9.11 Generator ID 1	P1	N-1	6.751	6.744	6.868					Explore potential mitigation
CYVL-VD-8	ROLLINS 60 kV	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1	P1	N-1	5.104	5.097	5.162					Explore potential mitigation
CYVL-VD-9	AEC_300 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.609	372.262	397.318					Explore potential mitigation
CYVL-VD-10	AEC_JCT 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.622	372.272	397.335					Explore potential mitigation
CYVL-VD-11	APPLE HL 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	74.467	73.28	75.935					Explore potential mitigation
CYVL-VD-12	ARBJCT 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	19.698	25.717	13.277					Explore potential mitigation
CYVL-VD-13	ARBUCKLE 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	20.745	27.36	13.951					Explore potential mitigation
CYVL-VD-14	ATLANTC 230 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	17.466	15.116	14.754					Explore potential mitigation
CYVL-VD-15	ATLANTIC 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	21.12	18.653	18.407					Explore potential mitigation
CYVL-VD-16	AVENA 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	643.839	351.421	379.186					Explore potential mitigation
CYVL-VD-17	BANTA 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	716.682	410.508	437.853					Explore potential mitigation
CYVL-VD-18	BEARDSLY 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	489.321	253.931	288.991					Explore potential mitigation
CYVL-VD-19	BELLOTA 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	145.73	76.44	76.392					Explore potential mitigation
CYVL-VD-20	BLLTAJCT 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	145.441	76.981	76.978					Explore potential mitigation
CYVL-VD-21	BNTA CRB 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	734.368	417.459	460.5					Explore potential mitigation
CYVL-VD-22	BNTA JCT 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	716.691	410.526	437.878					Explore potential mitigation
CYVL-VD-23	BONNIE N 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	14.585	12.647	12.364					Explore potential mitigation
CYVL-VD-24	BOWMN PH 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	11.306	11.099	9.059					Explore potential mitigation

Study Area: **PG&E Central Valley Sacramento**

Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %								Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	N/A	
CYVL-VD-25	BOWMN TP 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	12.403	11.246	10.204						Explore potential mitigation
CYVL-VD-26	BRDSLY J 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	489.363	253.99	289.073						Explore potential mitigation
CYVL-VD-27	BRKR SLG 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus	10.561	<5.0	<5.0						Explore potential mitigation
CYVL-VD-28	BRKR TP 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus	10.56	<5.0	<5.0						Explore potential mitigation
CYVL-VD-29	BRKRJCT 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus	10.546	<5.0	<5.0						Explore potential mitigation
CYVL-VD-30	BRNSWALT 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	15.337	12.529	12.409						Explore potential mitigation
CYVL-VD-31	BRNSWCKP 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	15.823	13	12.892						Explore potential mitigation
CYVL-VD-32	CACHE J1 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	15.635	18.164	12.848						Explore potential mitigation
CYVL-VD-33	CALPELLA 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	11.021	13.916	9.964						Explore potential mitigation
CYVL-VD-34	CALVO 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	717.285	410.621	438.176						Explore potential mitigation
CYVL-VD-35	CAMANCHE 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	144.266	76.626	76.651						Explore potential mitigation
CYVL-VD-36	CAMPUS 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus	9.809	<5.0	<5.0						Explore potential mitigation
CYVL-VD-37	CAPEHORN 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	14.759	12.791	12.545						Explore potential mitigation
CYVL-VD-38	CARBONA 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	716.953	411.004	439.329						Explore potential mitigation
CYVL-VD-39	CATARACT 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	583.368	300.816	337.084						Explore potential mitigation
CYVL-VD-40	CDCRSTN 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	146.521	78.238	78.328						Explore potential mitigation
CYVL-VD-41	CH.STN 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	502.629	268.199	298.739						Explore potential mitigation
CYVL-VD-42	CH.STNJT 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	502.763	268.243	301.333						Explore potential mitigation
CYVL-VD-43	CISCO GR 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	12.42	11.151	10.569						Explore potential mitigation
CYVL-VD-44	CISCOTAP 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	12.423	11.154	10.572						Explore potential mitigation
CYVL-VD-45	CITY UKH 115 kV	P2-3:A4:24:_NON-BUS-TIE BREAKER CB322 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	7.321	10.269	6.136						Explore potential mitigation
CYVL-VD-46	CL AMMNA 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	672.935	376.004	399.759						Explore potential mitigation
CYVL-VD-47	CLRKSVLE 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	72.957	72.2	74.015						Explore potential mitigation
CYVL-VD-48	CLRKSVLT 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	72.119	71.125	73.191						Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-49	CLSA CRS 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	22.121	29.318	14.832					Explore potential mitigation
CYVL-VD-50	CMNCHETP 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	145.125	76.901	76.918					Explore potential mitigation
CYVL-VD-51	COLFAXJT 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	14.752	12.785	12.54					Explore potential mitigation
CYVL-VD-52	CORT_D 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	29.475	34.011	24.593					Explore potential mitigation
CYVL-VD-53	CORTINA 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	18.923	24.634	12.785					Explore potential mitigation
CYVL-VD-54	CORTINA 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	29.474	34.009	24.593					Explore potential mitigation
CYVL-VD-55	CORTINA 230 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	32.781	36.441	27.903					Explore potential mitigation
CYVL-VD-56	CPEHRNTP 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	14.75	12.783	12.537					Explore potential mitigation
CYVL-VD-57	CPM 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	71.983	71.001	73.036					Explore potential mitigation
CYVL-VD-58	CRBNA JC 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	716.56	410.456	437.802					Explore potential mitigation
CYVL-VD-59	CROSRDJT 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	672.955	376.013	399.769					Explore potential mitigation
CYVL-VD-60	CRWS LDG 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	732.539	515.585	402.383					Explore potential mitigation
CYVL-VD-61	CRWS LDJ 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	732.053	514.713	402.459					Explore potential mitigation
CYVL-VD-62	CURTISS 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	498.376	265.043	298.525					Explore potential mitigation
CYVL-VD-63	DAVIS 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus-tie breaker	9.797	<5.0	<5.0					Explore potential mitigation
CYVL-VD-64	DEEPWATR 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus-tie breaker	11.572	<5.0	<5.0					Explore potential mitigation
CYVL-VD-65	DEL MAR 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	19.882	17.129	16.828					Explore potential mitigation
CYVL-VD-66	DELEVAN 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	21.514	28.426	14.439					Explore potential mitigation
CYVL-VD-67	DIMOND_1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	73.176	72.072	74.437					Explore potential mitigation
CYVL-VD-68	DIMOND_2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	74.78	73.855	76.117					Explore potential mitigation
CYVL-VD-69	DIST2047 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	20.589	26.959	13.847					Explore potential mitigation
CYVL-VD-70	DMND SPR 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	74.792	73.87	76.129					Explore potential mitigation
CYVL-VD-71	DPWTR_TP 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus-tie breaker	11.272	<5.0	<5.0					Explore potential mitigation
CYVL-VD-72	DRUM 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	14.476	12.557	12.253					Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-73	DRUM 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	18.889	16.627	16.689					Explore potential mitigation
CYVL-VD-74	DTCH FL1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	24.51	22.197	22.481					Explore potential mitigation
CYVL-VD-75	DTCH FL2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	17.401	14.963	14.966					Explore potential mitigation
CYVL-VD-76	DUNNIGAN 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	21.561	28.503	14.457					Explore potential mitigation
CYVL-VD-77	DUNNTAP 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	20.75	27.367	13.954					Explore potential mitigation
CYVL-VD-78	E.MRY J2 115 kV	P2-3:A5:16:_NON-BUS-TIE BREAKER CB1112 FAILURE AT EAST NICOLAUS 115 kV	P2	Bus-tie breaker	7.741	10.176	10.68					Explore potential mitigation
CYVL-VD-79	E.NICOLS 115 kV	P2-3:A5:17:_NON-BUS-TIE BREAKER CB1122 FAILURE AT EAST NICOLAUS 115 kV	P2	Bus-tie breaker	12.788	16.034	16.738					Explore potential mitigation
CYVL-VD-80	ELDORAD 115 kV	P2-2:A5:7_BUS FAULT AT 32018 GOLDHILL 115.00 Bus 2E	P2	Bus-tie breaker	16.496	14.808	21.658					Explore potential mitigation
CYVL-VD-81	ELLS GTY 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.944	379.369	404.23					Explore potential mitigation
CYVL-VD-82	ENCINAL 60 kV	P2-2:A5:21_BUS FAULT AT 32332 PEASE 60.00	P2	Bus-tie breaker	9.877	11.585	12.469					Explore potential mitigation
CYVL-VD-83	ENCL TAP 60 kV	P2-2:A5:21_BUS FAULT AT 32332 PEASE 60.00	P2	Bus-tie breaker	9.873	11.58	12.464					Explore potential mitigation
CYVL-VD-84	FBERBORD 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	498.307	264.979	298.465					Explore potential mitigation
CYVL-VD-85	FLINT 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	51.902	50.019	51.206					Explore potential mitigation
CYVL-VD-86	FORST HL 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	15.013	13.014	12.815					Explore potential mitigation
CYVL-VD-87	FRGTNTP1 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	570.001	295.473	332.043					Explore potential mitigation
CYVL-VD-88	FRGTNTP2 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	574.009	295.855	332.883					Explore potential mitigation
CYVL-VD-89	FROGTOWN 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	569.993	295.474	332.048					Explore potential mitigation
CYVL-VD-90	GOLD HLL 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	70.299	68.5	70.524					Explore potential mitigation
CYVL-VD-91	GOLDHILL 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	71.344	70.404	72.293					Explore potential mitigation
CYVL-VD-92	GRANITE 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	708.81	477.618	397.719					Explore potential mitigation
CYVL-VD-93	GRONMYER 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	721.343	411.167	439.361					Explore potential mitigation
CYVL-VD-94	GUSTINE 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	764.029	572.969	411.762					Explore potential mitigation
CYVL-VD-95	GUSTN JT 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	747.743	539.464	406.774					Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-96	GWFTRACY 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.652	372.232	397.353					Explore potential mitigation
CYVL-VD-97	HARINTON 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	20.966	27.67	14.087					Explore potential mitigation
CYVL-VD-98	HIGHLAND 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	12.903	15.009	10.595					Explore potential mitigation
CYVL-VD-99	HGHLNDJ2 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	12.901	15.006	10.593					Explore potential mitigation
CYVL-VD-100	HIGGINS 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	43.195	40.947	41.903					Explore potential mitigation
CYVL-VD-101	HOMEGRND 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	11.867	13.814	9.742					Explore potential mitigation
CYVL-VD-102	HOMSTKTP 115 kV	P2-3:A4:20:_NON-BUS-TIE BREAKER CB532 FAILURE AT CORTINA 115kV	P2	Non Bus-tie breaker	13.334	13.371	13.438					Explore potential mitigation
CYVL-VD-103	HORSESHE 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	64.572	63.357	64.9					Explore potential mitigation
CYVL-VD-104	HORSHE1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	64.571	63.356	64.899					Explore potential mitigation
CYVL-VD-105	HORSHE2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	63.803	62.522	64.074					Explore potential mitigation
CYVL-VD-106	HUSTD 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	19.194	25.013	12.957					Explore potential mitigation
CYVL-VD-107	INDIN VL 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	23.842	28.023	20.146					Explore potential mitigation
CYVL-VD-108	INGRM C. 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	694.388	434.209	398.017					Explore potential mitigation
CYVL-VD-109	KASSON 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	716.69	410.512	437.844					Explore potential mitigation
CYVL-VD-110	KASSON 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	673.209	376.976	401.801					Explore potential mitigation
CYVL-VD-111	LAMMERS 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	29.329	<5.0	<5.0					Explore potential mitigation
CYVL-VD-112	LEE_JCT 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	725.549	412.808	444.357					Explore potential mitigation
CYVL-VD-113	LEPRINO 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	672.325	377.455	402.242					Explore potential mitigation
CYVL-VD-114	LID 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	718.74	410.939	438.933					Explore potential mitigation
CYVL-VD-115	LINCLN 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	15.455	12.339	11.65					Explore potential mitigation
CYVL-VD-116	LIVE OAK 60 kV	P2-2:A5:21_BUS FAULT AT 32332 PEASE 60.00	P2	Bus	9.255	10.98	11.834					Explore potential mitigation
CYVL-VD-117	LOCKFORD 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	145.492	77.086	77.084					Explore potential mitigation
CYVL-VD-118	LOUISE 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	719.931	411.028	439.155					Explore potential mitigation
CYVL-VD-119	LTHRP JT 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	722.639	411.325	439.479					Explore potential mitigation

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Voltage Deviations



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-120	LUCERNJ1 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	18.881	22.691	16.267					Explore potential mitigation
CYVL-VD-121	LYOTH-SP 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	716.559	410.455	437.801					Explore potential mitigation
CYVL-VD-122	MANTECA 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	722.634	411.323	439.477					Explore potential mitigation
CYVL-VD-123	MANTECA 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	674.517	377.012	396.639					Explore potential mitigation
CYVL-VD-124	MAXTAP 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	21.512	28.423	14.438					Explore potential mitigation
CYVL-VD-125	MDSTO CN 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	709.831	477.686	398.126					Explore potential mitigation
CYVL-VD-126	MEDLIN J 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	730.872	513.422	399.254					Explore potential mitigation
CYVL-VD-127	MELNS JA 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	557.339	292.76	326.149					Explore potential mitigation
CYVL-VD-128	MELNS JB 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	564.011	293.434	327.863					Explore potential mitigation
CYVL-VD-129	MELONES 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	505.064	273.047	306.622					Explore potential mitigation
CYVL-VD-130	MILER TP 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	711.629	477.511	398.403					Explore potential mitigation
CYVL-VD-131	MILLER 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	711.602	477.506	398.383					Explore potential mitigation
CYVL-VD-132	MI-WUK 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	494.971	261.412	295.63					Explore potential mitigation
CYVL-VD-133	MIZOU_T1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	73.419	72.292	74.727					Explore potential mitigation
CYVL-VD-134	MNTCA JT 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	733.309	416.906	458.461					Explore potential mitigation
CYVL-VD-135	MSSDLESW 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	718.93	410.977	439.022					Explore potential mitigation
CYVL-VD-136	MTN_QJCT 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	48.222	44.891	46.319					Explore potential mitigation
CYVL-VD-137	NEWCSTL1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	56.115	54.458	55.746					Explore potential mitigation
CYVL-VD-138	NEWCSTL2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	55.771	54.089	55.378					Explore potential mitigation
CYVL-VD-139	NEWCSTLE 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	56.082	54.423	55.71					Explore potential mitigation
CYVL-VD-140	NWMN JCT 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	748.402	541.588	406.558					Explore potential mitigation
CYVL-VD-141	OI GLASS 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.408	373.325	398.052					Explore potential mitigation
CYVL-VD-142	OWENSTP1 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.552	373.398	398.14					Explore potential mitigation
CYVL-VD-143	OWENSTP2 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.745	372.872	397.786					Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-144	OXBOW 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	14.858	12.883	12.684					Explore potential mitigation
CYVL-VD-145	PATTERSN 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	725.327	502.918	400.653					Explore potential mitigation
CYVL-VD-146	PENRYN 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	49.888	46.352	47.988					Explore potential mitigation
CYVL-VD-147	PEORIA 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	503.148	268.516	301.75					Explore potential mitigation
CYVL-VD-148	PLACER 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	47.894	44.618	45.986					Explore potential mitigation
CYVL-VD-149	PLACER 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	49.978	47.997	49.134					Explore potential mitigation
CYVL-VD-150	PLCRVLB2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	74.865	73.871	76.256					Explore potential mitigation
CYVL-VD-151	PLSNT GR 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	19.729	17.077	16.698					Explore potential mitigation
CYVL-VD-152	POST 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus-tie breaker	11.273	2.919	3.1					Explore potential mitigation
CYVL-VD-153	Q539 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	725.224	503.484	396.767					Explore potential mitigation
CYVL-VD-154	Q539SS 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	725.229	503.501	396.775					Explore potential mitigation
CYVL-VD-155	R.TRACK 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	504.89	269.678	306.697					Explore potential mitigation
CYVL-VD-156	RCTRK J. 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	500.626	266.698	300.023					Explore potential mitigation
CYVL-VD-157	RIO OSO 230 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	13.204	11.135	10.729					Explore potential mitigation
CYVL-VD-158	RIPON 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	666.733	359.046	388.349					Explore potential mitigation
CYVL-VD-159	RIVRBKJT 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	635.053	332.722	370.732					Explore potential mitigation
CYVL-VD-160	ROCKLIN 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	19.491	16.815	16.498					Explore potential mitigation
CYVL-VD-161	RPN JNCN 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	670.264	366.602	392.503					Explore potential mitigation
CYVL-VD-162	RPNJN2 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	661.233	351.325	383.316					Explore potential mitigation
CYVL-VD-163	RVRBANK 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	161.694	95.484	110.847					Explore potential mitigation
CYVL-VD-164	RVRBK J1 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	144.132	74.418	74.263					Explore potential mitigation
CYVL-VD-165	RVRBK J2 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	650.757	351.797	378.47					Explore potential mitigation
CYVL-VD-166	RVRBK TP 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	188.188	109.608	125.14					Explore potential mitigation
CYVL-VD-167	SAFEWAY 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.62	372.356	397.406					Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %								Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	N/A	
CYVL-VD-168	SALADO 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	716.977	487.101	398.17						Explore potential mitigation
CYVL-VD-169	SALADO 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	711.654	476.719	398.215						Explore potential mitigation
CYVL-VD-170	SALADO J 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	708.924	470.212	398.225						Explore potential mitigation
CYVL-VD-171	SALDO TP 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	711.556	477.22	398.423						Explore potential mitigation
CYVL-VD-172	SANDBAR 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	489.902	254.492	289.487						Explore potential mitigation
CYVL-VD-173	SCHULTE 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.659	372.435	397.479						Explore potential mitigation
CYVL-VD-174	SFWY_TP1 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.632	372.361	397.413						Explore potential mitigation
CYVL-VD-175	SFWY_TP2 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	671.648	372.371	397.423						Explore potential mitigation
CYVL-VD-176	SHADYGLN 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	14.75	12.784	12.539						Explore potential mitigation
CYVL-VD-177	SHPRING 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	74.307	73.473	75.546						Explore potential mitigation
CYVL-VD-178	SHPRING1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	72.955	71.877	74.178						Explore potential mitigation
CYVL-VD-179	SHPRING2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	74.283	73.446	75.521						Explore potential mitigation
CYVL-VD-180	SIERRAPI 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	19.882	17.129	16.828						Explore potential mitigation
CYVL-VD-181	SJ COGEN 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	672.521	375.519	398.971						Explore potential mitigation
CYVL-VD-182	SNDBR JT 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	490.201	254.871	289.962						Explore potential mitigation
CYVL-VD-183	SP CMPNY 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	673.444	370.818	391.157						Explore potential mitigation
CYVL-VD-184	SPAULDNG 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	12.336	11.169	10.141						Explore potential mitigation
CYVL-VD-185	SPC JCT. 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	673.253	375.03	398.511						Explore potential mitigation
CYVL-VD-186	SPICAMIN 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	74.456	73.267	75.924						Explore potential mitigation
CYVL-VD-187	SPRNG GP 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	490.185	254.851	289.929						Explore potential mitigation
CYVL-VD-188	STANISLS 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	587.18	302.778	338.625						Explore potential mitigation
CYVL-VD-189	STKTON A 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	146.674	78.534	78.655						Explore potential mitigation
CYVL-VD-190	STKTON B 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	145.916	77.437	77.478						Explore potential mitigation
CYVL-VD-191	STNSLSRP 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	722.323	497.901	395.583						Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-192	TAYLOR 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	19.459	16.787	16.47					Explore potential mitigation
CYVL-VD-193	TCHRT_T1 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	709.239	477.754	397.991					Explore potential mitigation
CYVL-VD-194	TCHRT_T2 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	694.398	434.901	398.602					Explore potential mitigation
CYVL-VD-195	TCHRTJCT 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	709.087	477.692	397.903					Explore potential mitigation
CYVL-VD-196	TESLAMTR 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	672.52	375.519	398.971					Explore potential mitigation
CYVL-VD-197	TH.E.DV. 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	673.37	375.069	398.335					Explore potential mitigation
CYVL-VD-198	TRACY 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	672.377	377.384	402.17					Explore potential mitigation
CYVL-VD-199	TRACY JC 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	672.24	377.92	402.714					Explore potential mitigation
CYVL-VD-200	TULLOCH 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	412.224	233.947	263.079					Explore potential mitigation
CYVL-VD-201	UCD_TP2 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus-tie breaker	9.804	<5.0	<5.0					Explore potential mitigation
CYVL-VD-202	ULTRA JT 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	18.923	16.183	15.733					Explore potential mitigation
CYVL-VD-203	VALLY HM 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	642.646	337.385	375.039					Explore potential mitigation
CYVL-VD-204	VIERATP1 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	672.699	375.604	399.058					Explore potential mitigation
CYVL-VD-205	VIERATP2 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	673.014	375.628	399.106					Explore potential mitigation
CYVL-VD-206	VIERRA 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	672.952	375.723	399.182					Explore potential mitigation
CYVL-VD-207	VLVHMTP1 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	642.648	337.382	375.03					Explore potential mitigation
CYVL-VD-208	VLVHMTP2 115 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	654.496	354.477	380.482					Explore potential mitigation
CYVL-VD-209	W.SCRMNO 115 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus	11.427	<5.0	<5.0					Explore potential mitigation
CYVL-VD-210	WADHMJCT 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	19.36	25.304	12.494					Explore potential mitigation
CYVL-VD-211	WESCOT1 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	20.184	26.593	13.014					Explore potential mitigation
CYVL-VD-212	WESCOT2 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	19.47	25.47	12.562					Explore potential mitigation
CYVL-VD-213	WESTLEY 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	743.825	422.288	479.864					Explore potential mitigation
CYVL-VD-214	WILKINS 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	20.582	26.95	13.842					Explore potential mitigation
CYVL-VD-215	WILL JCT 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	20.23	26.55	13.619					Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-216	WILLIAMS 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	19.621	25.679	12.652					Explore potential mitigation
CYVL-VD-217	WILSONAV 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	22.234	29.484	14.906					Explore potential mitigation
CYVL-VD-218	WLKSLJCT 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	20.507	26.845	13.793					Explore potential mitigation
CYVL-VD-219	WSID 60 kV	P2-4:A11:60:_33540 Tesla 115 kV Bus CB102 Internal Breaker Fault	P2	Bus-tie breaker	743.767	422.26	479.75					Explore potential mitigation
CYVL-VD-220	APLHTAP1 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	12.834	11.399	16.204					Explore potential mitigation
CYVL-VD-221	APLHTAP2 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	18.132	16.337	22.599					Explore potential mitigation
CYVL-VD-222	APPLE HL 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	12.847	11.41	16.222					Explore potential mitigation
CYVL-VD-223	BIGGS 60 kV	P2-1:A5:97:_ENCL TAP-PEASE #1 60 kV	P2-1	Line section w/o fault	5.332	6.925	7.552					Explore potential mitigation
CYVL-VD-224	BIGGSJCT 60 kV	P2-1:A5:97:_ENCL TAP-PEASE #1 60 kV	P2-1	Line section w/o fault	5.327	6.918	7.544					Explore potential mitigation
CYVL-VD-225	CLRKSVLT 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	<5.0	<5.0	5.263					Explore potential mitigation
CYVL-VD-226	DIMOND_1 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	7.707	6.745	9.861					Explore potential mitigation
CYVL-VD-227	DIMOND_2 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	20.972	19.051	25.964					Explore potential mitigation
CYVL-VD-228	DMND SPR 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	20.977	19.055	25.971					Explore potential mitigation
CYVL-VD-229	ELDORAD 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	14.972	13.356	18.799					Explore potential mitigation
CYVL-VD-230	ENCINAL 60 kV	P2-1:A5:97:_ENCL TAP-PEASE #1 60 kV	P2-1	Line section w/o fault	9.796	11.548	12.451					Explore potential mitigation
CYVL-VD-231	ENVRO_HY 60 kV	P2-1:A5:127:_ENVRO_HY-OXBOW #1 60 kV	P2-1	Line section w/o fault	6.585	6.579	6.702					Explore potential mitigation
CYVL-VD-232	FORST HL 60 kV	P2-1:A5:126:_ENVRO_HY-FORST HL #1 60 kV	P2-1	Line section w/o fault	5.924	5.918	6.035					Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-233	GLEAF2 60 kV	P2-1:A5:72:_OLIVH J1-RIO OSO #1 115 kV	P2-1	Line section w/o fault	8.795	1.895	1.401					Explore potential mitigation
CYVL-VD-234	GRIDLEY 60 kV	P2-1:A5:97:_ENCL TAP-PEASE #1 60 kV	P2-1	Line section w/o fault	6.664	8.386	9.112					Explore potential mitigation
CYVL-VD-235	HARTER 60 kV	P2-1:A5:101:_PEASE-PEASETP #1 60 kV	P2-1	Line section w/o fault	13.022	<5.0	<5.0					Explore potential mitigation
CYVL-VD-236	LIVE OAK 60 kV	P2-1:A5:98:_ENCL TAP-LIVE OAK #1 60 kV	P2-1	Line section w/o fault	8.919	10.681	11.542					Explore potential mitigation
CYVL-VD-237	OLIVH J1 115 kV	P2-1:A5:72:_OLIVH J1-RIO OSO #1 115 kV	P2-1	Line section w/o fault	11.757	5.761	5.019					Explore potential mitigation
CYVL-VD-238	PEACHTON 60 kV	P2-1:A5:98:_ENCL TAP-LIVE OAK #1 60 kV	P2-1	Line section w/o fault	6.006	7.688	8.372					Explore potential mitigation
CYVL-VD-239	PEAS RG 60 kV	P2-1:A5:72:_OLIVH J1-RIO OSO #1 115 kV	P2-1	Line section w/o fault	8.181	<5.0	<5.0					Explore potential mitigation
CYVL-VD-240	PEASE 60 kV	P2-1:A5:73:_OLIVH J1-E.MRY J1 #1 115 kV	P2-1	Line section w/o fault	5.586	<5.0	<5.0					Explore potential mitigation
CYVL-VD-241	PEASE 115 kV	P2-1:A5:73:_OLIVH J1-E.MRY J1 #1 115 kV	P2-1	Line section w/o fault	5.497	<5.0	<5.0					Explore potential mitigation
CYVL-VD-242	PLCRVLB2 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	20.132	18.235	24.977					Explore potential mitigation
CYVL-VD-243	PLCRVLB3 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	20.135	18.237	24.981					Explore potential mitigation
CYVL-VD-244	PLCRVLT1 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	9.406	8.269	12.004					Explore potential mitigation
CYVL-VD-245	SHPRING 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	22.444	20.5	27.652					Explore potential mitigation
CYVL-VD-246	VACA-JT1 60 kV	P2-1:A4:97:_VACA-DXN-VACA-JT1 #1 60 kV	P2-1	Line section w/o fault	6.493	<5.0	<5.0					Explore potential mitigation
CYVL-VD-247	YUBACITY 60 kV	P2-1:A5:101:_PEASE-PEASETP #1 60 kV	P2-1	Line section w/o fault	13.003	<5.0	<5.0					Explore potential mitigation
CYVL-VD-248	ARBUCKLE 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:44:_Cortina 60 kV Line No. 1	P3	G-1/N-1	<5.0	5.921	6.001					Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-VD-249	CATARACT 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line	P3	G-1/N-1	5.078	<5.0	<5.0						Explore potential mitigation
CYVL-VD-250	CH.STN 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line	P3	G-1/N-1	5.756	<5.0	<5.0						Explore potential mitigation
CYVL-VD-251	CLSA JCT 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:43:_Cortina No. 4 60 kV Line	P3	G-1/N-1	<5.0	5.69	5.387						Explore potential mitigation
CYVL-VD-252	CORTINA 115 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-3:A4:5:_Cortina 230/115 kV Transformer No. 4	P3	G-1/N-1	<5.0	5.663	<5.0						Explore potential mitigation
CYVL-VD-253	CORTINA 115 kV	P1-1:A4:8:_WADHAM 9.11 Generator ID 1 and P1-3:A4:5:_Cortina 230/115 kV Transformer No. 4	P3	G-1/N-1	<5.0	<5.0	6.582						Explore potential mitigation
CYVL-VD-254	CURTISS 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P3	G-1/N-1	5.573	<5.0	<5.0						Explore potential mitigation
CYVL-VD-255	ENCINAL 60 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A5:31:_Palermo - Pease 115 kV Line	P3	G-1/N-1	5.275	<5.0	<5.0						Explore potential mitigation
CYVL-VD-256	ENVRO_HY 60 kV	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1 and P1-1:A5:26:_OXBOW F 9.11 Generator ID 1	P3	G-1/N-1	<5.0	<5.0	7.311						Explore potential mitigation
CYVL-VD-257	FORST HL 60 kV	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1 and P1-1:A5:26:_OXBOW F 9.11 Generator ID 1	P3	G-1/N-1	<5.0	<5.0	6.538						Explore potential mitigation
CYVL-VD-258	FRGTNTP1 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line	P3	G-1/N-1	5.293	<5.0	<5.0						Explore potential mitigation
CYVL-VD-259	FROGTOWN 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line	P3	G-1/N-1	5.294	<5.0	<5.0						Explore potential mitigation
CYVL-VD-260	GUSTINE 60 kV	P1-1:A12:4:_Q539 34.50 Generator ID 1 and P1-2:A12:17:_Salado-S539SS #1 60 kV Line	P3	G-1/N-1	5.455	5.122	8.105						Explore potential mitigation
CYVL-VD-261	HARTER 60 kV	P1-1:A12:8:_STANISLS 13.80 Generator ID 1 and P1-2:A5:31:_Palermo - Pease 115 kV Line	P3	G-1/N-1	5.369	<5.0	<5.0						Explore potential mitigation
CYVL-VD-262	JAMESN-A 115 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:41:_Vaca - Suisun 115 kV Line	P3	G-1/N-1	<5.0	7.142	7.647						Explore potential mitigation
CYVL-VD-263	LAMMERS 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:59:_Schulte - Lammers 115 kV Line	P3	G-1/N-1	<5.0	5.511	5.514						Explore potential mitigation
CYVL-VD-264	LIVE OAK 60 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A5:31:_Palermo - Pease 115 kV Line	P3	G-1/N-1	5.237	<5.0	<5.0						Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-265	LTHRP JT 60 kV	P1-1:A11:7:_GWFTRCY1 13.80 Generator ID 1 and P1-3:A11:21:_Manteca 115/60 kV Transformer No. 3	P3	G-1/N-1	<5.0	<5.0	5.276					Explore potential mitigation
CYVL-VD-266	MANTECA 60 kV	P1-1:A11:7:_GWFTRCY1 13.80 Generator ID 1 and P1-3:A11:21:_Manteca 115/60 kV Transformer No. 3	P3	G-1/N-1	<5.0	<5.0	5.276					Explore potential mitigation
CYVL-VD-267	MELONES 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line	P3	G-1/N-1	6.298	<5.0	<5.0					Explore potential mitigation
CYVL-VD-268	MERIDIAN 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:43:_Cortina No. 4 60 kV Line	P3	G-1/N-1	>0.90	5.773	5.465					Explore potential mitigation
CYVL-VD-269	MRYSVLE 60 kV	P1-1:A12:8:_STANISLS 13.80 Generator ID 1 and P1-2:A5:31:_Palermo - Pease 115 kV Line	P3	G-1/N-1	5.359	<5.0	<5.0					Explore potential mitigation
CYVL-VD-270	NEWMAN 60 kV	P1-1:A12:4:_Q539 34.50 Generator ID 1 and P1-2:A12:16:_Salado - Newman 60 kV Line No. 2	P3	G-1/N-1	7.109	6.876	5.332					Explore potential mitigation
CYVL-VD-271	OI GLASS 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:59:_Schulte - Lammers 115 kV Line	P3	G-1/N-1	<5.0	5.4	5.399					Explore potential mitigation
CYVL-VD-272	OWENSTP1 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:59:_Schulte - Lammers 115 kV Line	P3	G-1/N-1	<5.0	5.397	5.396					Explore potential mitigation
CYVL-VD-273	OXBOW 60 kV	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1 and P1-1:A5:26:_OXBOW F 9.11 Generator ID 1	P3	G-1/N-1	<5.0	<5.0	7.505					Explore potential mitigation
CYVL-VD-274	PEORIA 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line	P3	G-1/N-1	5.857	<5.0	<5.0					Explore potential mitigation
CYVL-VD-275	Q539 60 kV	P1-1:A12:4:_Q539 34.50 Generator ID 1 and P1-2:A12:17:_Salado-S539SS #1 60 kV Line	P3	G-1/N-1	7.342	6.99	10.147					Explore potential mitigation
CYVL-VD-276	Q539SS 60 kV	P1-1:A12:4:_Q539 34.50 Generator ID 1 and P1-2:A12:17:_Salado-S539SS #1 60 kV Line	P3	G-1/N-1	7.342	6.99	10.147					Explore potential mitigation
CYVL-VD-277	R.TRACK 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line	P3	G-1/N-1	6.313	<5.0	<5.0					Explore potential mitigation
CYVL-VD-278	RIPON 115 kV	P1-1:A12:6:_DONNELLS 13.80 Generator ID 1 and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P3	G-1/N-1	5.579	8.026	<5.0					Explore potential mitigation
CYVL-VD-279	RIPON 115 kV	P1-1:A12:8:_STANISLS 13.80 Generator ID 1 and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P3	G-1/N-1	7.331	<5.0	9.777					Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-280	ROLLINS 60 kV	P1-1:A5:26:_OXBOW F 9.11 Generator ID 1 and P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1	P3	G-1/N-1	<5.0	<5.0	5.531					Explore potential mitigation
CYVL-VD-281	RPNJN2 115 kV	P1-1:A12:8:_STANISLS 13.80 Generator ID 1 and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P3	G-1/N-1	7	<5.0	9.253					Explore potential mitigation
CYVL-VD-282	SCHMLBCH 115 kV	P1-1:A11:11:_GWFTRCY3 13.80 Generator ID 1 and P1-2:A4:41:_Vaca - Suisun 115 kV Line	P3	G-1/N-1	<5.0	7.126	7.661					Explore potential mitigation
CYVL-VD-283	STANISLS 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line	P3	G-1/N-1	5.004	<5.0	<5.0					Explore potential mitigation
CYVL-VD-284	SUISUN 115 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:41:_Vaca - Suisun 115 kV Line	P3	G-1/N-1	<5.0	7.539	8.064					Explore potential mitigation
CYVL-VD-285	VALLY HM 115 kV	P1-1:A12:8:_STANISLS 13.80 Generator ID 1 and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P3	G-1/N-1	6.035	<5.0	7.942					Explore potential mitigation
CYVL-VD-286	WESTLEY 60 kV	P1-1:A11:11:_GWFTRCY3 13.80 Generator ID 1 and P1-3:A11:21:_Manteca 115/60 kV Transformer No. 3	P3	G-1/N-1	<5.0	<5.0	5.143					Explore potential mitigation
CYVL-VD-287	WILKINS 60 kV	P1-1:A4:6:_SOLANO 34.50 Generator ID 1 and P1-2:A4:42:_Cortina 60 kV Line No. 1	P3	G-1/N-1	8.323	<5.0	<5.0					Explore potential mitigation
CYVL-VD-288	WSID 60 kV	P1-1:A11:11:_GWFTRCY3 13.80 Generator ID 1 and P1-3:A11:21:_Manteca 115/60 kV Transformer No. 3	P3	G-1/N-1	<5.0	<5.0	5.141					Explore potential mitigation
CYVL-VD-289	ALMENDRA 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	80.64	<10.0	<10.0					Explore potential mitigation
CYVL-VD-290	AMERESCO 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	17.059	<10.0	<10.0					Explore potential mitigation
CYVL-VD-291	APLHTAP1 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	70.46	71.067	73.547					Explore potential mitigation
CYVL-VD-292	APLHTAP2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	70.966	71.581	73.945					Explore potential mitigation
CYVL-VD-293	APPLE HL 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	70.483	71.099	73.538					Explore potential mitigation
CYVL-VD-294	ARBALT 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	22.743	10.486					Explore potential mitigation
CYVL-VD-295	ARBALT 60 kV	P1-3:A4:6:_Cortina 230/115/60 kV Transformer No. 1 and P1-3:A4:5:_Cortina 230/115 kV Transformer No. 4	P6	N-1/N-1	<10.0	10.482	<10.0					Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-VD-296	ARBJCT 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	22.743	10.486						Explore potential mitigation
CYVL-VD-297	ARBJCT 60 kV	P1-2:A4:17:_Cortina - Vaca 230 kV Line and P1-2:A3:9:_Delevan-Cortina 230 kV Line	P6	N-1/N-1	<10.0	22.812	10.433						Explore potential mitigation
CYVL-VD-298	ATLANTIC 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	13.169	13.825	13.794						Explore potential mitigation
CYVL-VD-299	AUBURN 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	41.28	41.57	43.073						Explore potential mitigation
CYVL-VD-300	BELL PGE 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	42.319	43.635	44.852						Explore potential mitigation
CYVL-VD-301	BIGGS 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	46.693	<10.0	<10.0						Explore potential mitigation
CYVL-VD-302	BONNIE N 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	10.05	18.008	16.214						Explore potential mitigation
CYVL-VD-303	BRIGHTN 115 kV	P1-3:A4:4:_Brighton 230/115 kV Transformer No. 9 and P1-3:A4:3:_Brighton 230/115 kV Transformer No. 10	P6	N-1/N-1	16.151	<10.0	<10.0						Explore potential mitigation
CYVL-VD-304	BRIGHTON 230 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	18.428	<10.0	<10.0						Explore potential mitigation
CYVL-VD-305	BRKR SLG 115 kV	P1-3:A4:4:_Brighton 230/115 kV Transformer No. 9 and P1-3:A4:3:_Brighton 230/115 kV Transformer No. 10	P6	N-1/N-1	12.945	<10.0	<10.0						Explore potential mitigation
CYVL-VD-306	BRKR TP 115 kV	P1-2:A5:13:_Rio Oso - Brighton 230 kV Line and P1-2:4:3:_Brighton - Bellota 230 kV Line	P6	N-1/N-1	12.261	<10.0	<10.0						Explore potential mitigation
CYVL-VD-307	BRKRJCT 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	11.952	<10.0	<10.0						Explore potential mitigation
CYVL-VD-308	BRUNSWCK 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	10.46	13.649	12.979						Explore potential mitigation
CYVL-VD-309	CACHE J1 115 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	17.138	11.592						Explore potential mitigation
CYVL-VD-310	CAMPUS 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	11.236	<10.0	<10.0						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-VD-311	CAPEHORN 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	10.161	18.815	16.935						Explore potential mitigation
CYVL-VD-312	CH.STN 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	11.578	6.428	5.051						Explore potential mitigation
CYVL-VD-313	CH.STNJT 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	11.574	6.426	5.06						Explore potential mitigation
CYVL-VD-314	CHCGO PK 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	24.417	27.566	27.535						Explore potential mitigation
CYVL-VD-315	CHILCT 69 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	<10.0	15.036	<10.0						Explore potential mitigation
CYVL-VD-316	CISCO GR 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	8.66	15.697	13.424						Explore potential mitigation
CYVL-VD-317	CISCOTAP 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	8.663	15.701	13.427						Explore potential mitigation
CYVL-VD-318	CITY UKH 115 kV	P1-2:A4:17:_Cortina - Vaca 230 kV Line and P1-2:A3:9:_Delevan-Cortina 230 kV Line	P6	N-1/N-1	<10.0	11.505	7.901						Explore potential mitigation
CYVL-VD-319	CLARK RD 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	17.172	<10.0	<10.0						Explore potential mitigation
CYVL-VD-320	CLRKSVLE 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	69.088	70.024	72.044						Explore potential mitigation
CYVL-VD-321	CLRKSVLT 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	68.002	68.841	71.031						Explore potential mitigation
CYVL-VD-322	CLSA CRS 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	25.907	11.733						Explore potential mitigation
CYVL-VD-323	COLFAXJT 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	10.15	18.797	16.954						Explore potential mitigation
CYVL-VD-324	CORT_D 115 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	31.532	21.693						Explore potential mitigation
CYVL-VD-325	CORTINA 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	21.786	10.093						Explore potential mitigation
CYVL-VD-326	CORTINA 230 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	30.248	23.169						Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-VD-327	CPEHRNTP 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	10.155	18.802	16.923						Explore potential mitigation
CYVL-VD-328	CPM 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	67.859	68.712	70.884						Explore potential mitigation
CYVL-VD-329	CPM TAP 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	67.859	68.712	70.884						Explore potential mitigation
CYVL-VD-330	CRTNA M 230 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	24.129	14.717						Explore potential mitigation
CYVL-VD-331	DAVIS 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	11.222	<10.0	<10.0						Explore potential mitigation
CYVL-VD-332	DEL MAR 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	10.46	11.117	11.04						Explore potential mitigation
CYVL-VD-333	DELEVAN 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	25.121	11.418						Explore potential mitigation
CYVL-VD-334	DIMOND_1 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	69.092	69.827	72.157						Explore potential mitigation
CYVL-VD-335	DIMOND_2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	71.13	71.822	74						Explore potential mitigation
CYVL-VD-336	DMND SPR 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	71.147	71.839	74.014						Explore potential mitigation
CYVL-VD-337	DRAKE 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	24.586	11.185						Explore potential mitigation
CYVL-VD-338	DRHM JCA 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	17.152	<10.0	<10.0						Explore potential mitigation
CYVL-VD-339	DRHMSW45 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	17.158	<10.0	<10.0						Explore potential mitigation
CYVL-VD-340	DRUM 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	14.018	18.616	17.846						Explore potential mitigation
CYVL-VD-341	DTCH FL1 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	19.32	23.217	22.828						Explore potential mitigation
CYVL-VD-342	DTCH FL2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	12.383	16.89	16.171						Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-VD-343	DUNNIGAN 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	25.197	11.429						Explore potential mitigation
CYVL-VD-344	DUNNTAP 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	24.195	11.029						Explore potential mitigation
CYVL-VD-345	EDGMNT 69 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	<10.0	18.567	<10.0						Explore potential mitigation
CYVL-VD-346	ELDORAD 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	70.565	71.124	73.638						Explore potential mitigation
CYVL-VD-347	ENVRO_HY 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	10.238	20.335	18.36						Explore potential mitigation
CYVL-VD-348	FLINT 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	45.93	47.133	48.495						Explore potential mitigation
CYVL-VD-349	FRGTNTP1 115 kV	P1-2:A12:10:_Donnells - Curtis 115 kV Line and P1-2:A11:7:_Bellota-Riverbank-Melones 115 kV Line	P6	N-1/N-1	10.118	<10.0	<10.0						Explore potential mitigation
CYVL-VD-350	GOLD HLL 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	65.941	66.083	68.341						Explore potential mitigation
CYVL-VD-351	GOLDHILL 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	67.167	68.085	70.185						Explore potential mitigation
CYVL-VD-352	GRAND IS 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	15.541	<10.0	<10.0						Explore potential mitigation
CYVL-VD-353	GRIDLEY 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	55.329	<10.0	<10.0						Explore potential mitigation
CYVL-VD-354	GRSS VLY 60 kV	P1-3:A5:27:_ROLLINS 60/6.6 kV GSU Transformer and P1-2:A5:54:_Colgate-Grass Valley 60 kV Line	P6	N-1/N-1	10.967	11.509	11.996						Explore potential mitigation
CYVL-VD-355	HALSEY 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	41.317	41.557	43.153						Explore potential mitigation
CYVL-VD-356	HARTER 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	80.916	<10.0	<10.0						Explore potential mitigation
CYVL-VD-357	HAYPRESS 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	<10.0	16.999	13.591						Explore potential mitigation
CYVL-VD-358	HIGHLAND 115 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	14.169	<10.0						Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-VD-359	HHSIERRA 69 kV	P1-3:A5:6: Goldhill #2 230/115 kV Transformer and P1-3:A5:5: Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	<10.0	19.064	<10.0						Explore potential mitigation
CYVL-VD-360	HIGGINS 115 kV	P1-3:A5:6: Goldhill #2 230/115 kV Transformer and P1-3:A5:5: Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	37.106	38.823	39.677						Explore potential mitigation
CYVL-VD-361	HOMEGRND 115 kV	P1-2:A3:9: Delevan-Cortina 230 kV Line and P1-2:A4:17: Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	13.043	<10.0						Explore potential mitigation
CYVL-VD-362	HOMEPROC 115 kV	P1-2:A3:9: Delevan-Cortina 230 kV Line and P1-2:A4:17: Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	13.043	<10.0						Explore potential mitigation
CYVL-VD-363	HOMSTKTP 115 kV	P1-2:A3:9: Delevan-Cortina 230 kV Line and P1-2:A4:17: Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	12.98	<10.0						Explore potential mitigation
CYVL-VD-364	HORSESHE 115 kV	P1-3:A5:5: Goldhill #1 230/115 kV Transformer and P1-3:A5:6: Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	59.779	60.841	62.764						Explore potential mitigation
CYVL-VD-365	HORSHE1 115 kV	P1-3:A5:5: Goldhill #1 230/115 kV Transformer and P1-3:A5:6: Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	59.778	60.84	62.763						Explore potential mitigation
CYVL-VD-366	HORSHE2 115 kV	P1-3:A5:5: Goldhill #1 230/115 kV Transformer and P1-3:A5:6: Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	58.989	59.986	61.783						Explore potential mitigation
CYVL-VD-367	HUSTD 60 kV	P1-2:A3:9: Delevan-Cortina 230 kV Line and P1-2:A4:17: Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	22.121	10.23						Explore potential mitigation
CYVL-VD-368	INDIN VL 115 kV	P1-2:A3:9: Delevan-Cortina 230 kV Line and P1-2:A4:17: Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	25.971	17.592						Explore potential mitigation
CYVL-VD-369	LIMESTNE 60 kV	P1-3:A5:5: Goldhill #1 230/115 kV Transformer and P1-3:A5:6: Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	67.395	67.53	69.712						Explore potential mitigation
CYVL-VD-370	LIVE OAK 60 kV	P1-3:A5:41: New Pease #5 115/60 kV Transformer and P1-3:A5:9: Pease #2 115/60 kV Transformer	P6	N-1/N-1	70.13	<10.0	<10.0						Explore potential mitigation
CYVL-VD-371	LUCERNE 115 kV	P1-2:A3:9: Delevan-Cortina 230 kV Line and P1-2:A4:17: Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	20.944	13.937						Explore potential mitigation
CYVL-VD-372	MARBLE 69 kV	P1-3:A5:5: Goldhill #1 230/115 kV Transformer and P1-3:A5:6: Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	<10.0	13.466	5.118						Explore potential mitigation
CYVL-VD-373	MAXTAP 60 kV	P1-2:A3:9: Delevan-Cortina 230 kV Line and P1-2:A4:17: Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	25.118	11.417						Explore potential mitigation
CYVL-VD-374	MAXWELL 60 kV	P1-2:A3:9: Delevan-Cortina 230 kV Line and P1-2:A4:17: Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	25.125	11.42						Explore potential mitigation

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	
CYVL-VD-375	MELONES 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	10.774	<10.0	<10.0					Explore potential mitigation
CYVL-VD-376	MENDOCNO 115 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	<10.0	13.302	8.488					Explore potential mitigation
CYVL-VD-377	MRYSVLE 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	80.68	<10.0	<10.0					Explore potential mitigation
CYVL-VD-378	MTN_QJCT 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	41.338	41.622	43.137					Explore potential mitigation
CYVL-VD-379	MTN_QUAR 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	41.573	41.856	43.404					Explore potential mitigation
CYVL-VD-380	NEWCSTL1 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	50.574	51.745	53.319					Explore potential mitigation
CYVL-VD-381	NEWCSTL2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	50.189	51.319	52.813					Explore potential mitigation
CYVL-VD-382	PENRYN 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	42.525	42.887	44.584					Explore potential mitigation
CYVL-VD-383	PLACER 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	41.054	41.35	42.869					Explore potential mitigation
CYVL-VD-384	PLACER 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	43.83	45.061	46.359					Explore potential mitigation
CYVL-VD-385	PLCRVLB2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	71.166	71.821	74.065					Explore potential mitigation
CYVL-VD-386	PLCRVLB2 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	71.234	71.862	74.157					Explore potential mitigation
CYVL-VD-387	PLCRVLB3 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	71.176	71.83	74.073					Explore potential mitigation
CYVL-VD-388	POST 115 kV	P1-3:A4:4:_Brighton 230/115 kV Transformer No. 9 and P1-3:A4:3:_Brighton 230/115 kV Transformer No. 10	P6	N-1/N-1	14.091	<10.0	<10.0					Explore potential mitigation
CYVL-VD-389	R.TRACK 115 kV	P1-2:A12:10:_Donnells - Curtis 115 kV Line and P1-2:A11:7:_Bellota-Riverbank-Melones 115 kV Line	P6	N-1/N-1	12.147	<10.0	<10.0					Explore potential mitigation
CYVL-VD-390	RCTRK J. 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	12.594	<10.0	<10.0					Explore potential mitigation

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Voltage Deviations



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-VD-391	RIPON 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P6	N-1/N-1	<10.0	11.083	<10.0						Explore potential mitigation
CYVL-VD-392	ROLLINS 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	10.089	18.696	16.826						Explore potential mitigation
CYVL-VD-393	ROLLNSTP 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	10.109	18.717	16.882						Explore potential mitigation
CYVL-VD-394	SHPRING 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	70.669	71.429	73.538						Explore potential mitigation
CYVL-VD-395	SPAULDNG 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	<10.0	16.981	14.359						Explore potential mitigation
CYVL-VD-396	SPICAMIN 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	70.469	71.084	73.525						Explore potential mitigation
CYVL-VD-397	SUMMIT 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	<10.0	14.993	12.902						Explore potential mitigation
CYVL-VD-398	TAMARACK 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	<10.0	15.483	13.265						Explore potential mitigation
CYVL-VD-399	TAYLOR 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	10.281	10.929	10.828						Explore potential mitigation
CYVL-VD-400	TBL MT2M 230 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	10.758	<10.0	<10.0						Explore potential mitigation
CYVL-VD-401	TBLE MTN 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	17.274	<10.0	<10.0						Explore potential mitigation
CYVL-VD-402	TRES VIS 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	34.788	<10.0	<10.0						Explore potential mitigation
CYVL-VD-403	UCD_TP2 115 kV	P1-3:A4:4:_Brighton 230/115 kV Transformer No. 9 and P1-3:A4:3:_Brighton 230/115 kV Transformer No. 10	P6	N-1/N-1	12.198	<10.0	<10.0						Explore potential mitigation
CYVL-VD-404	UCDAVSJ1 115 kV	P1-3:A4:4:_Brighton 230/115 kV Transformer No. 9 and P1-3:A4:3:_Brighton 230/115 kV Transformer No. 10	P6	N-1/N-1	12.198	<10.0	<10.0						Explore potential mitigation
CYVL-VD-405	ULTRA JT 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	11.235	11.708	11.477						Explore potential mitigation

Study Area: PG&E Central Valley Sacramento

Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-VD-406	W.SCRMNO 115 kV	P1-3:A4:4:_Brighton 230/115 kV Transformer No. 9 and P1-3:A4:3:_Brighton 230/115 kV Transformer No. 10	P6	N-1/N-1	14.291	<10.0	<10.0						Explore potential mitigation
CYVL-VD-407	WADHMJCT 60 kV	P1-2:A4:17:_Cortina - Vaca 230 kV Line and P1-2:A3:9:_Delevan-Cortina 230 kV Line	P6	N-1/N-1	<10.0	22.445	10.102						Explore potential mitigation
CYVL-VD-408	WEMR SWS 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	10.208	19.1	17.229						Explore potential mitigation
CYVL-VD-409	WILSONAV 60 kV	P1-3:A4:6:_Cortina 230/115/60 kV Transformer No. 1 and P1-3:A4:5:_Cortina 230/115 kV Transformer No. 4	P6	N-1/N-1	<10.0	11.697	<10.0						Explore potential mitigation
CYVL-VD-410	YBA CTYJ 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	80.639	<10.0	<10.0						Explore potential mitigation
CYVL-VD-411	ALMENDRA 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	88.306	483.375	<10.0						Explore potential mitigation
CYVL-VD-412	E.MRYSVE 115 kV	P7-1:A5:12_Rio Oso-Nicolaus 115 kV Line & Bogue-Rio Oso 115 kV Line	P7	DCTL	<10.0	10.093	10.422						Explore potential mitigation
CYVL-VD-413	ENCINAL 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	79.633	444.327	<10.0						Explore potential mitigation
CYVL-VD-414	GLEAF2 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	88.305	481.863	<10.0						Explore potential mitigation
CYVL-VD-415	GLEAF2TP 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	88.305	482.579	<10.0						Explore potential mitigation
CYVL-VD-416	HARTER 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	88.274	495.95	<10.0						Explore potential mitigation
CYVL-VD-417	LIVE OAK 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	76.223	426.164	<10.0						Explore potential mitigation
CYVL-VD-418	MRYSVLE 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	88.101	488.936	<10.0						Explore potential mitigation
CYVL-VD-419	PEAS RG 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	82.15	451.056	<10.0						Explore potential mitigation
CYVL-VD-420	PEASE 115 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	85.328	462.18	<10.0						Explore potential mitigation
CYVL-VD-421	YBA CTYJ 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	88.305	483.371	<10.0						Explore potential mitigation
CYVL-VD-422	YUBACITY 60 kV	P7-1:A5:20_Palermo-Pease 115 kV Line & Pease-Rio Oso 115 kV Line	P7	DCTL	88.306	495.966	<10.0						Explore potential mitigation

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High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-1	PLAINFLD 60 kV	P1-2:A3:5:_Delevan-Cortina 230 kV Line	P1	N-1	0.8586	>0.90	>0.90						Explore potential mitigation
CYVL-V-2	PLFLDJCT 60 kV	P1-2:A3:5:_Delevan-Cortina 230 kV Line	P1	N-1	0.8718	>0.90	>0.90						Explore potential mitigation
CYVL-V-3	AEC_300 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.7301	>0.90	>0.90						Explore potential mitigation
CYVL-V-4	AEC_JCT 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.7308	>0.90	>0.90						Explore potential mitigation
CYVL-V-5	APLHTAP1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2791	0.2976	0.2691						Explore potential mitigation
CYVL-V-6	APLHTAP2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2691	0.287	0.2586						Explore potential mitigation
CYVL-V-7	APPLE HL 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2775	0.296	0.2674						Explore potential mitigation
CYVL-V-8	ARBALT 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7992	0.752	0.8737						Explore potential mitigation
CYVL-V-9	ARBUCKLE 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.757	0.702	0.8329						Explore potential mitigation
CYVL-V-10	ATLANTC 230 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8174	0.8497	0.8545						Explore potential mitigation
CYVL-V-11	ATLANTIC 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8028	0.8352	0.8397						Explore potential mitigation
CYVL-V-12	AUBURN 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.5412	0.5713	0.5561						Explore potential mitigation
CYVL-V-13	AVENA 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.2734	0.8122	0.8218						Explore potential mitigation
CYVL-V-14	BANTA 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5859	>0.90	>0.90						Explore potential mitigation
CYVL-V-15	BELL PGE 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.5303	0.5573	0.5454						Explore potential mitigation
CYVL-V-16	BNTA CRB 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.4108	>0.90	>0.90						Explore potential mitigation
CYVL-V-17	BNTA JCT 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5861	>0.90	>0.90						Explore potential mitigation
CYVL-V-18	BONNIE N 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8496	0.8716	0.8723						Explore potential mitigation
CYVL-V-19	BRIGHTON 230 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8712	0.9075	0.9108						Explore potential mitigation
CYVL-V-20	BRNSWALT 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8883	0.9177	0.9188						Explore potential mitigation
CYVL-V-21	BRNSWCKP 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8775	0.9076	0.9081						Explore potential mitigation

Study Area: **PG&E Central Valley Sacramento**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAE	N/A	N/A	N/A	N/A	
CYVL-V-22	CACHE J1 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.8672	0.8461	>0.90					Explore potential mitigation
CYVL-V-23	CALVO 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.576	>0.90	>0.90					Explore potential mitigation
CYVL-V-24	CAPEHORN 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8438	0.8661	0.8641					Explore potential mitigation
CYVL-V-25	CHCGO PK 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.7453	0.7722	0.7665					Explore potential mitigation
CYVL-V-26	CL AMMNA 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5558	>0.90	>0.90					Explore potential mitigation
CYVL-V-27	CLRKSVLE 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2936	0.3087	0.2894					Explore potential mitigation
CYVL-V-28	CLSA CRS 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	0.7072	0.6478	0.7856					Explore potential mitigation
CYVL-V-29	CLSA JCT 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Bus-tie breaker	0.7693	0.7136	0.8603					Explore potential mitigation
CYVL-V-30	COLFAXJT 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8444	0.8668	0.8646					Explore potential mitigation
CYVL-V-31	COLUSA 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7024	0.6425	0.7809					Explore potential mitigation
CYVL-V-32	CORT_D 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7666	0.7296	0.8267					Explore potential mitigation
CYVL-V-33	CORTINA 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7667	0.7297	0.8268					Explore potential mitigation
CYVL-V-34	CORTINA 230 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.6699	0.6369	0.7234					Explore potential mitigation
CYVL-V-35	CPEHRNTP 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8444	0.8667	0.8647					Explore potential mitigation
CYVL-V-36	CPM 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.3153	0.3324	0.3115					Explore potential mitigation
CYVL-V-37	CPM TAP 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.3153	0.3324	0.3115					Explore potential mitigation
CYVL-V-38	CROSRDJT 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5559	0.9151	>0.90					Explore potential mitigation
CYVL-V-39	CRTNA M 230 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7319	0.6939	0.7942					Explore potential mitigation
CYVL-V-40	CRWS LDG 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.6218	>0.90	>0.90					Explore potential mitigation
CYVL-V-41	CRWS LDJ 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.6274	>0.90	>0.90					Explore potential mitigation
CYVL-V-42	DEL MAR 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8014	0.8374	0.8398					Explore potential mitigation
CYVL-V-43	DELEVAN 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7316	0.6752	0.8092					Explore potential mitigation

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High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-44	DIMOND_1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2997	0.3176	0.293						Explore potential mitigation
CYVL-V-45	DIMOND_2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2655	0.2819	0.2566						Explore potential mitigation
CYVL-V-46	DIST2047 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7605	0.71	0.8369						Explore potential mitigation
CYVL-V-47	DRAKE 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7432	0.6872	0.8202						Explore potential mitigation
CYVL-V-48	DRUM 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8646	0.8899	0.8889						Explore potential mitigation
CYVL-V-49	DTCH FL1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8029	0.8291	0.8256						Explore potential mitigation
CYVL-V-50	DTCH FL2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8782	>0.90	>0.90						Explore potential mitigation
CYVL-V-51	DUNNTAP 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7568	0.7018	0.8328						Explore potential mitigation
CYVL-V-52	E.NICOLS 115 kV	P2-3:A5:16:_NON-BUS-TIE BREAKER CB1112 FAILURE AT EAST NICOLAUS 115 kV	P2	Non Bus-tie breaker	0.9009	0.8666	0.8618						Explore potential mitigation
CYVL-V-53	ELDORAD 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.276	0.2954	0.2649						Explore potential mitigation
CYVL-V-54	ELLS GTY 115 kV	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	0.6888	>0.90	>0.90						Explore potential mitigation
CYVL-V-55	ENCINAL 60 kV	P2-2:A5:21_BUS FAULT AT 32332 PEASE 60.00	P2	Bus	0.8939	0.8929	0.8884						Explore potential mitigation
CYVL-V-56	ENCL TAP 60 kV	P2-2:A5:21_BUS FAULT AT 32332 PEASE 60.00	P2	Bus	0.8943	0.8933	0.8888						Explore potential mitigation
CYVL-V-57	ENVRO_HY 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8394	0.8613	0.8556						Explore potential mitigation
CYVL-V-58	FLINT 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.4976	0.523	0.5105						Explore potential mitigation
CYVL-V-59	FORST HL 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8308	0.8528	0.8471						Explore potential mitigation
CYVL-V-60	GOLD HLL 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.3394	0.3572	0.3365						Explore potential mitigation
CYVL-V-61	GOLDHILL 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.3234	0.3403	0.3211						Explore potential mitigation
CYVL-V-62	GRANITE 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.7166	>0.90	>0.90						Explore potential mitigation
CYVL-V-63	GRIDLEY 60 kV	P2-2:A5:21_BUS FAULT AT 32332 PEASE 60.00	P2	Bus	0.9053	>0.90	>0.90						Explore potential mitigation
CYVL-V-64	GUSTINE 60 kV	P2-2:A11:42:_30625 Tesla 230 kV Bus Section 1D	P2	Bus-tie breaker	0.8929	>0.90	>0.90						Explore potential mitigation
CYVL-V-65	GUSTN JT 60 kV	P2-2:A11:43:_30625 Tesla 230 kV Bus Section 2D	P2	Bus-tie breaker	0.894	>0.90	>0.90						Explore potential mitigation
CYVL-V-66	GWFTRACY 115 kV	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	0.7587	>0.90	>0.90						Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-67	HARINTON 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7476	0.6918	0.8242						Explore potential mitigation
CYVL-V-68	HIGGINS 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.5896	0.6176	0.607						Explore potential mitigation
CYVL-V-69	HJ HEINZ 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.6146	>0.90	>0.90						Explore potential mitigation
CYVL-V-70	HOMEGRND 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.892	0.8758	>0.90						Explore potential mitigation
CYVL-V-71	HORSESHE 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.378	0.3972	0.3811						Explore potential mitigation
CYVL-V-72	HUSTD 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.8189	0.7736	0.8922						Explore potential mitigation
CYVL-V-73	INDIN VL 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.814	0.7807	0.8617						Explore potential mitigation
CYVL-V-74	INGRM C. 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.6299	>0.90	>0.90						Explore potential mitigation
CYVL-V-75	KASSON 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5866	>0.90	>0.90						Explore potential mitigation
CYVL-V-76	KASSON 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5803	>0.90	>0.90						Explore potential mitigation
CYVL-V-77	KSSN-JC1 115 kV	P2-2:A11:58:_33540 Tesla 115 kV Bus Section 1	P2	Bus-tie breaker	0.8922	>0.90	>0.90						Explore potential mitigation
CYVL-V-78	KSSN-JC2 115 kV	P2-2:A11:58:_33540 Tesla 115 kV Bus Section 1	P2	Bus-tie breaker	0.892	>0.90	>0.90						Explore potential mitigation
CYVL-V-79	LEPRINO 115 kV	P2-2:A11:58:_33540 Tesla 115 kV Bus Section 1	P2	Bus-tie breaker	0.8962	>0.90	>0.90						Explore potential mitigation
CYVL-V-80	LID 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.555	>0.90	>0.90						Explore potential mitigation
CYVL-V-81	LIMESTNE 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.3183	0.3351	0.3144						Explore potential mitigation
CYVL-V-82	LINCLN 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8636	0.8977	0.9088						Explore potential mitigation
CYVL-V-83	LIVE OAK 60 kV	P2-2:A5:21_BUS FAULT AT 32332 PEASE 60.00	P2	Bus-tie breaker	0.8944	0.8934	0.8889						Explore potential mitigation
CYVL-V-84	LOUISE 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5403	>0.90	>0.90						Explore potential mitigation
CYVL-V-85	LTHRP JT 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5183	>0.90	>0.90						Explore potential mitigation
CYVL-V-86	LUCERNE 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.8551	0.8255	0.8914						Explore potential mitigation

Study Area: **PG&E Central Valley Sacramento**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-87	MANTECA 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.4705	0.8848	0.891						Explore potential mitigation
CYVL-V-88	MDSTO CN 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.7079	>0.90	>0.90						Explore potential mitigation
CYVL-V-89	MDWYWND 115 kV	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	0.8681	>0.90	>0.90						Explore potential mitigation
CYVL-V-90	MEDLIN J 60 kV	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	0.7561	>0.90	>0.90						Explore potential mitigation
CYVL-V-91	MERIDIAN 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7547	0.6962	0.8459						Explore potential mitigation
CYVL-V-92	MIDDLTWN 115 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.8925	0.8777	0.9152						Explore potential mitigation
CYVL-V-93	MILLER 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.6663	>0.90	>0.90						Explore potential mitigation
CYVL-V-94	MIZOU_T1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2963	0.3144	0.289						Explore potential mitigation
CYVL-V-95	MIZOU_T2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2653	0.282	0.2561						Explore potential mitigation
CYVL-V-96	MSSDLESW 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5524	>0.90	>0.90						Explore potential mitigation
CYVL-V-97	MTN_QJCT 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.5398	0.57	0.5546						Explore potential mitigation
CYVL-V-98	MTN_QUAR 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.5334	0.5641	0.5481						Explore potential mitigation
CYVL-V-99	NEWCSTLE 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.4591	0.4822	0.4687						Explore potential mitigation
CYVL-V-100	NEWMAN 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5987	>0.90	>0.90						Explore potential mitigation
CYVL-V-101	NWMN JCT 60 kV	P2-2:A11:43:_30625 Tesla 230 kV Bus Section 2D	P2	Bus-tie breaker	0.8952	>0.90	>0.90						Explore potential mitigation
CYVL-V-102	OI GLASS 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.6722	>0.90	>0.90						Explore potential mitigation
CYVL-V-103	OWENSTP1 115 kV	P2-2:A11:58:_33540 Tesla 115 kV Bus Section 1	P2	Bus-tie breaker	0.8989	>0.90	>0.90						Explore potential mitigation
CYVL-V-104	OWENSTP2 115 kV	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	0.7562	>0.90	>0.90						Explore potential mitigation
CYVL-V-105	OXBOW 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8416	0.8634	0.8578						Explore potential mitigation
CYVL-V-106	PATTERSN 60 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.6416	>0.90	>0.90						Explore potential mitigation
CYVL-V-107	PEAS RG 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8828	0.9328	0.9421						Explore potential mitigation

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High/Low Voltage



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-108	PENRYN 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.5101	0.542	0.5241						Explore potential mitigation
CYVL-V-109	PLACER 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.5459	0.5755	0.561						Explore potential mitigation
CYVL-V-110	PLACER 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.5156	0.5419	0.53						Explore potential mitigation
CYVL-V-111	PLAINFLD 60 kV	P2-2:A11:43:_30625 Tesla 230 kV Bus Section 2D	P2	Bus-tie breaker	0.8584	>0.90	>0.90						Explore potential mitigation
CYVL-V-112	PLCRVLT1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2929	0.3112	0.2849						Explore potential mitigation
CYVL-V-113	PLCRVLT2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2651	0.2821	0.2555						Explore potential mitigation
CYVL-V-114	Q539 60 kV	P2-2:A11:58:_33540 Tesla 115 kV Bus Section 1	P2	Bus-tie breaker	0.8623	>0.90	>0.90						Explore potential mitigation
CYVL-V-115	Q539SS 60 kV	P2-2:A11:58:_33540 Tesla 115 kV Bus Section 1	P2	Bus-tie breaker	0.8622	>0.90	>0.90						Explore potential mitigation
CYVL-V-116	RCTRK J. 115 kV	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	0.8966	>0.90	>0.90						Explore potential mitigation
CYVL-V-117	RIO OSO 230 kV	P2-2:A4:8_BUS FAULT AT 31984 BRIGHTN 115.00	P2	Bus-tie breaker	0.9651	>0.90	>0.90						Explore potential mitigation
CYVL-V-118	RIPON 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.2981	0.8166	0.8251						Explore potential mitigation
CYVL-V-119	RIVRBKJT 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.1064	0.7488	0.7612						Explore potential mitigation
CYVL-V-120	ROCKLIN 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8159	0.8511	0.854						Explore potential mitigation
CYVL-V-121	RPN JNCN 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.3729	0.8453	0.8528						Explore potential mitigation
CYVL-V-122	SAFEWAY 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.7035	>0.90	>0.90						Explore potential mitigation
CYVL-V-123	SALADO 60 kV	P2-2:A11:58:_33540 Tesla 115 kV Bus Section 1	P2	Bus-tie breaker	0.8638	>0.90	>0.90						Explore potential mitigation
CYVL-V-124	SCHULTE 115 kV	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	0.7587	>0.90	>0.90						Explore potential mitigation
CYVL-V-125	SFWY_TP1 115 kV	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	0.7586	>0.90	>0.90						Explore potential mitigation
CYVL-V-126	SFWY_TP2 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.7041	>0.90	>0.90						Explore potential mitigation
CYVL-V-127	SHADYGLN 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8445	0.8668	0.8647						Explore potential mitigation
CYVL-V-128	SHPRING 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2737	0.2893	0.2665						Explore potential mitigation
CYVL-V-129	SHPRING1 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.3027	0.3205	0.2966						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-130	SHPRING2 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2743	0.29	0.2671						Explore potential mitigation
CYVL-V-131	SIERRAPI 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8014	0.8374	0.8398						Explore potential mitigation
CYVL-V-132	SJ COGEN 115 kV	P2-2:A11:58:_33540 Tesla 115 kV Bus Section 1	P2	Bus-tie breaker	0.8888	>0.90	>0.90						Explore potential mitigation
CYVL-V-133	SPICAMIN 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.2778	0.2962	0.2677						Explore potential mitigation
CYVL-V-134	SUMMIT 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.9047	0.9274	0.9302						Explore potential mitigation
CYVL-V-135	TAYLOR 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8175	0.8528	0.8558						Explore potential mitigation
CYVL-V-136	TCHRT_T1 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.7187	0.9619	0.9715						Explore potential mitigation
CYVL-V-137	TCHRT_T2 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.6804	>0.90	>0.90						Explore potential mitigation
CYVL-V-138	TESLA 115 kV	P2-2:A11:59:_33540 Tesla 115 kV Bus Section 2	P2	Bus-tie breaker	0.8682	>0.90	>0.90						Explore potential mitigation
CYVL-V-139	TESLAMTR 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5462	>0.90	>0.90						Explore potential mitigation
CYVL-V-140	TH.E.DV. 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.7122	>0.90	>0.90						Explore potential mitigation
CYVL-V-141	TRACY 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.6165	>0.90	>0.90						Explore potential mitigation
CYVL-V-142	ULTRA JT 115 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8227	0.8558	0.865						Explore potential mitigation
CYVL-V-143	VALLY HM 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.1361	0.7587	0.7704						Explore potential mitigation
CYVL-V-144	VIERATP1 115 kV	P2-3:A11:45:_30624 Tesla 230 kV Bus CB892 Internal Breaker Fault (2D and Bank #4)	P2	Bus-tie breaker	0.8993	>0.90	>0.90						Explore potential mitigation
CYVL-V-145	VIERATP2 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5569	>0.90	>0.90						Explore potential mitigation
CYVL-V-146	VIERRA 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.5483	>0.90	>0.90						Explore potential mitigation
CYVL-V-147	VLYHMTP1 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.1363	0.7588	0.7705						Explore potential mitigation
CYVL-V-148	VLYHMTP2 115 kV	P2-4:A11:18:_30500 Bellota 230 kV Bus CB400 Internal Breaker Fault (1D and 2D)	P2	Bus-tie breaker	0.2787	0.8323	0.8416						Explore potential mitigation

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High/Low Voltage



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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-149	WADHMJCT 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.8125	0.7652	>0.90						Explore potential mitigation
CYVL-V-150	WEMR SWS 60 kV	P2-4:A5:3_GOLDHILL 230 kV Bus 1 and 2 - CB 202 Failure	P2	Bus-tie breaker	0.8398	0.8622	0.8595						Explore potential mitigation
CYVL-V-151	WESCOT1 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7771	0.7229	0.868						Explore potential mitigation
CYVL-V-152	WESCOT2 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.8078	0.7598	0.8986						Explore potential mitigation
CYVL-V-153	WILKINS 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7602	0.7097	0.8366						Explore potential mitigation
CYVL-V-154	WILLIAMS 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.8001	0.7516	0.8914						Explore potential mitigation
CYVL-V-155	WILSONAV 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7026	0.6426	0.781						Explore potential mitigation
CYVL-V-156	WLKSLJCT 60 kV	P2-3:A4:22:_NON-BUS-TIE BREAKER CB312 FAILURE AT CORTINA 230kV	P2	Non Bus-tie breaker	0.7635	0.7133	0.8398						Explore potential mitigation
CYVL-V-157	WSID 60 kV	P2-4:A11:50:_33514 Manteca 115 kV Bus CB124 Internal Breaker Fault	P2	Bus-tie breaker	0.8618	0.8788	0.8745						Explore potential mitigation
CYVL-V-158	APPLE HL 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	0.8937	0.9147	0.8646						Explore potential mitigation
CYVL-V-159	DIMOND_2 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	0.8036	0.8299	0.7582						Explore potential mitigation
CYVL-V-160	DMND SPR 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	0.8033	0.8297	0.7579						Explore potential mitigation
CYVL-V-161	E.MRY J1 115 kV	P2-1:A5:72:_OLIVH J1-RIO OSO #1 115 kV	P2-1	Line section w/o fault	0.8846	0.9513	0.9622						Explore potential mitigation
CYVL-V-162	ELDORAD 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	0.8724	0.8949	0.8384						Explore potential mitigation
CYVL-V-163	ENCINAL 60 kV	P2-1:A5:97:_ENCL TAP-PEASE #1 60 kV	P2-1	Line section w/o fault	0.8947	0.8932	0.8886						Explore potential mitigation
CYVL-V-164	LIVE OAK 60 kV	P2-1:A5:98:_ENCL TAP-LIVE OAK #1 60 kV	P2-1	Line section w/o fault	0.8978	0.8964	0.8919						Explore potential mitigation
CYVL-V-165	OLIVHRST 115 kV	P2-1:A5:72:_OLIVH J1-RIO OSO #1 115 kV	P2-1	Line section w/o fault	0.8812	>0.90	>0.90						Explore potential mitigation
CYVL-V-166	PEAS RG 60 kV	P2-1:A5:21:_PEASE-HONC JT1 #1 115 kV	P2-1	Line section w/o fault	0.8926	>0.90	>0.90						Explore potential mitigation
CYVL-V-167	PEASE 115 kV	P2-1:A5:72:_OLIVH J1-RIO OSO #1 115 kV	P2-1	Line section w/o fault	0.8886	>0.90	>0.90						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-168	PLAINFLD 60 kV	P2-1:A4:102:_TRAVIS-TRAVISJT #1 60 kV	P2-1	Line section w/o fault	0.8705	>0.90	>0.90						Explore potential mitigation
CYVL-V-169	PLCRVLT2 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	0.8124	0.8384	0.7682						Explore potential mitigation
CYVL-V-170	PLFLDJCT 60 kV	P2-1:A4:102:_TRAVIS-TRAVISJT #1 60 kV	P2-1	Line section w/o fault	0.8835	>0.90	>0.90						Explore potential mitigation
CYVL-V-171	SHPRING 115 kV	P2-1:A5:18:_GOLDHILL-SHPRING2 #2 115 kV	P2-1	Line section w/o fault	0.7923	0.8191	0.7454						Explore potential mitigation
CYVL-V-172	ARBALT 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:44:_Cortina 60 kV Line No. 1	P3	G-1/N-1	>0.9	0.8957	0.8912						Explore potential mitigation
CYVL-V-173	ARBUCKLE 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:44:_Cortina 60 kV Line No. 1	P3	G-1/N-1	>0.9	0.8953	0.8908						Explore potential mitigation
CYVL-V-174	CLSA CRS 60 kV	P1-1:A11:11:_GWFTRCY3 13.80 Generator ID 1 and P1-3:A4:15:_Cortina #5 115/60 kV Transformer	P3	G-1/N-1	>0.9	0.8969	>0.9						Explore potential mitigation
CYVL-V-175	CLSA CRS 60 kV	P1-1:A4:8:_WADHAM 9.11 Generator ID 1 and P1-3:A4:15:_Cortina #5 115/60 kV Transformer	P3	G-1/N-1	>0.9	>0.9	0.8818						Explore potential mitigation
CYVL-V-176	COLUSA 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-3:A4:15:_Cortina #5 115/60 kV Transformer	P3	G-1/N-1	>0.9	0.8923	>0.9						Explore potential mitigation
CYVL-V-177	COLUSA 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-3:A4:5:_Cortina 230/115 kV Transformer No. 4	P3	G-1/N-1	>0.9	>0.9	0.8976						Explore potential mitigation
CYVL-V-178	DIST2047 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:44:_Cortina 60 kV Line No. 1	P3	G-1/N-1	>0.9	0.8666	0.8603						Explore potential mitigation
CYVL-V-179	DIST2047 60 kV	P1-1:A4:6:_SOLANO 34.50 Generator ID 1 and P1-2:A4:42:_Cortina 60 kV Line No. 1	P3	G-1/N-1	0.8813	>0.9	>0.9						Explore potential mitigation
CYVL-V-180	DUNNIGAN 60 kV	P1-1:A4:8:_WADHAM 9.11 Generator ID 1 and P1-3:A4:15:_Cortina #5 115/60 kV Transformer	P3	G-1/N-1	>0.9	>0.9	0.8937						Explore potential mitigation
CYVL-V-181	ENVRO_HY 60 kV	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1 and P1-1:A5:26:_OXBOW F 9.11 Generator ID 1	P3	G-1/N-1	>0.9	>0.9	0.8638						Explore potential mitigation
CYVL-V-182	FORST HL 60 kV	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1 and P1-1:A5:26:_OXBOW F 9.11 Generator ID 1	P3	G-1/N-1	>0.9	>0.9	0.8638						Explore potential mitigation

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High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-183	GRSS VLY 60 kV	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1 and P1-2:A5:54:_Colgate-Grass Valley 60 kV Line	P3	G-1/N-1	0.8958	0.8962	0.8903						Explore potential mitigation
CYVL-V-184	MEDLIN J 60 kV	P1-1:A12:4:_Q539 34.50 Generator ID 1 and P1-2:A12:17:_Salado-S539SS #1 60 kV Line	P3	G-1/N-1	0.8817	0.9242	0.9138						Explore potential mitigation
CYVL-V-185	MERIDIAN 60 kV	P1-1:A4:8:_WADHAM 9.11 Generator ID 1 and P1-2:A4:43:_Cortina No. 4 60 kV Line	P3	G-1/N-1	>0.9	>0.9	0.8831						Explore potential mitigation
CYVL-V-186	NEWMAN 60 kV	P1-1:A11:11:_GWFTRCY3 13.80 Generator ID 1 and P1-2:A12:16:_Salado - Newman 60 kV Line No. 2	P3	G-1/N-1	>0.9	0.8982	0.9298						Explore potential mitigation
CYVL-V-187	NEWMAN 60 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A12:16:_Salado - Newman 60 kV Line No. 2	P3	G-1/N-1	0.8825	>0.9	>0.9						Explore potential mitigation
CYVL-V-188	OXBOW 60 kV	P1-1:A5:23:_ROLLINSF 6.60 Generator ID 1 and P1-1:A5:26:_OXBOW F 9.11 Generator ID 1	P3	G-1/N-1	>0.9	>0.9	0.8639						Explore potential mitigation
CYVL-V-189	PLAINFLD 60 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-3:A4:14:_Vaca Dixon 115/60 kV Transformer No. 9	P3	G-1/N-1	0.8317	>0.9	>0.9						Explore potential mitigation
CYVL-V-190	Q539 60 kV	P1-1:A12:4:_Q539 34.50 Generator ID 1 and P1-2:A12:17:_Salado-S539SS #1 60 kV Line	P3	G-1/N-1	0.8817	0.9242	0.9138						Explore potential mitigation
CYVL-V-191	RIPON 115 kV	P1-1:A12:8:_STANISLS 13.80 Generator ID 1 and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P3	G-1/N-1	0.8611	>0.9	0.8822						Explore potential mitigation
CYVL-V-192	RPNJN2 115 kV	P1-1:A12:8:_STANISLS 13.80 Generator ID 1 and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P3	G-1/N-1	0.8664	>0.9	0.8879						Explore potential mitigation
CYVL-V-193	VALLY HM 115 kV	P1-1:A11:46:_STANISLS 13.80 Generator ID 1 and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P3	G-1/N-1	0.8782	>0.9	0.9009						Explore potential mitigation
CYVL-V-194	WESTLEY 60 kV	P1-1:A11:11:_GWFTRCY3 13.80 Generator ID 1 and P1-3:A11:21:_Manteca 115/60 kV Transformer No. 3	P3	G-1/N-1	>0.9	>0.9	0.8602						Explore potential mitigation
CYVL-V-195	WILKINS 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-2:A4:44:_Cortina 60 kV Line No. 1	P3	G-1/N-1	>0.9	0.8663	0.86						Explore potential mitigation
CYVL-V-196	WILSONAV 60 kV	P1-1:A11:1:_0227-WD 230.00 Generator ID FW and P1-3:A4:15:_Cortina #5 115/60 kV Transformer	P3	G-1/N-1	>0.9	0.8924	>0.9						Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-197	WILSONAV 60 kV	P1-1:A11:1: _0227-WD 230.00 Generator ID FW and P1-3:A4:5: _Cortina 230/115 kV Transformer No. 4	P3	G-1/N-1	>0.9	>0.9	0.8977						Explore potential mitigation
CYVL-V-198	WSID 60 kV	P1-1:A11:11: _GWFTRCY3 13.80 Generator ID 1 and P1-3:A11:21: _Manteca 115/60 kV Transformer No. 3	P3	G-1/N-1	>0.9	>0.9	0.8605						Explore potential mitigation
CYVL-V-199	ALMENDRA 60 kV	P1-3:A5:41: _New Pease #5 115/60 kV Transformer and P1-3:A5:9: _Pease #2 115/60 kV Transformer	P6	N-1/N-1	0.1667	>0.9	>0.9						Explore potential mitigation
CYVL-V-200	AMERESCO 60 kV	P1-3:A5:41: _New Pease #5 115/60 kV Transformer and P1-3:A5:9: _Pease #2 115/60 kV Transformer	P6	N-1/N-1	0.8254	>0.9	>0.9						Explore potential mitigation
CYVL-V-201	APPLE HL 115 kV	P1-3:A5:5: _Goldhill #1 230/115 kV Transformer and P1-3:A5:6: _Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.3114	0.3138	0.2865						Explore potential mitigation
CYVL-V-202	ARBALT 60 kV	P1-2:A4:41: _Vaca - Suisun 115 kV Line and P1-2:A4:44: _Cortina 60 kV Line No. 1	P6	N-1/N-1	>0.9	0.8943	0.8938						Explore potential mitigation
CYVL-V-203	ARBALT 60 kV	P1-2:A4:42: _Cortina 60 kV Line No. 1 and P1-3:A4:5: _Cortina 230/115 kV Transformer No. 4	P6	N-1/N-1	0.8896	>0.9	>0.9						Explore potential mitigation
CYVL-V-204	ARBUCKLE 60 kV	P1-2:A3:22: _Palermo - Bogue 115 kV Line and P1-2:A4:44: _Cortina 60 kV Line No. 1	P6	N-1/N-1	>0.9	0.8949	0.8909						Explore potential mitigation
CYVL-V-205	ARBUCKLE 60 kV	P1-2:A3:5: _Delevan-Cortina 230 kV Line and P1-3:A4:17: _Cortina #5 115/60 kV Transformer	P6	N-1/N-1	0.8773	>0.9	>0.9						Explore potential mitigation
CYVL-V-206	ATLANTC 230 kV	P1-3:A5:5: _Goldhill #1 230/115 kV Transformer and P1-3:A5:6: _Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8978	0.9019	0.9037						Explore potential mitigation
CYVL-V-207	ATLANTIC 115 kV	P1-3:A5:5: _Goldhill #1 230/115 kV Transformer and P1-3:A5:6: _Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8811	0.8837	0.8855						Explore potential mitigation
CYVL-V-208	AUBURN 60 kV	P1-3:A5:5: _Goldhill #1 230/115 kV Transformer and P1-3:A5:6: _Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.6064	0.6034	0.5868						Explore potential mitigation
CYVL-V-209	AVENA 115 kV	P1-2:A11:65: _Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10: _Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8914	>0.9	>0.9						Explore potential mitigation
CYVL-V-210	BCKWRTH 69 kV	P1-3:A5:5: _Goldhill #1 230/115 kV Transformer and P1-3:A5:6: _Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.8683	>0.9						Explore potential mitigation
CYVL-V-211	BELL PGE 115 kV	P1-3:A5:5: _Goldhill #1 230/115 kV Transformer and P1-3:A5:6: _Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.5885	0.5831	0.5707						Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	N/A	
CYVL-V-212	BIGGS 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	0.473	>0.9	>0.9						Explore potential mitigation
CYVL-V-213	BONNIE N 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8945	0.7862	0.8162						Explore potential mitigation
CYVL-V-214	BRIGHTN 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8825	>0.9	>0.9						Explore potential mitigation
CYVL-V-215	BRIGHTON 230 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.7684	>0.9	>0.9						Explore potential mitigation
CYVL-V-216	BRKR SLG 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8851	>0.9	>0.9						Explore potential mitigation
CYVL-V-217	BRKR TP 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8853	>0.9	>0.9						Explore potential mitigation
CYVL-V-218	BRKRJCT 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8854	>0.9	>0.9						Explore potential mitigation
CYVL-V-219	BRUNSWCK 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.9237	0.8794	0.8908						Explore potential mitigation
CYVL-V-220	BTTE CRK 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	0.8352	>0.9	>0.9						Explore potential mitigation
CYVL-V-221	CACHE J1 115 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.8524	0.9054						Explore potential mitigation
CYVL-V-222	CAMPUS 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8834	>0.9	>0.9						Explore potential mitigation
CYVL-V-223	CAPEHORN 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.8893	0.7562	0.7868						Explore potential mitigation
CYVL-V-224	CH.STN 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8396	>0.9	>0.9						Explore potential mitigation
CYVL-V-225	CH.STNJT 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8399	>0.9	>0.9						Explore potential mitigation
CYVL-V-226	CHCGO PK 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.7984	0.7592	0.764						Explore potential mitigation
CYVL-V-227	CHILCT 69 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.8357	>0.9						Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-228	CISCO GR 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.9393	0.8469	0.8923						Explore potential mitigation
CYVL-V-229	CL AMMNA 115 kV	P1-2:A11:5:_Tesla - Vierra 115 kV Line and P1-3:A11:18:_Tesla 230/115 kV Transformer No. 1	P6	N-1/N-1	0.8955	>0.9	>0.9						Explore potential mitigation
CYVL-V-230	CLARK RD 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	0.8146	>0.9	>0.9						Explore potential mitigation
CYVL-V-231	CLRKSVLE 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.3253	0.3253	0.3034						Explore potential mitigation
CYVL-V-232	CLSA CRS 60 kV	P1-2:A3:5:_Delevan-Cortina 230 kV Line and P1-3:A4:17:_Cortina #5 115/60 kV Transformer	P6	N-1/N-1	0.8367	>0.9	>0.9						Explore potential mitigation
CYVL-V-233	CNTRVLE 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	0.8282	>0.9	>0.9						Explore potential mitigation
CYVL-V-234	COLFAXJT 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.8899	0.7561	0.7867						Explore potential mitigation
CYVL-V-235	CORT_D 115 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.74	0.8346						Explore potential mitigation
CYVL-V-236	CORTINA 115 kV	P1-2:A4:17:_Cortina - Vaca 230 kV Line and P1-2:A3:9:_Delevan-Cortina 230 kV Line	P6	N-1/N-1	>0.9	0.7402	0.8311						Explore potential mitigation
CYVL-V-237	CPEHRNTP 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.8898	0.7568	0.7875						Explore potential mitigation
CYVL-V-238	CPM 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.3498	0.3504	0.3276						Explore potential mitigation
CYVL-V-239	CROSRDJT 115 kV	P1-2:A11:5:_Tesla - Vierra 115 kV Line and P1-3:A11:18:_Tesla 230/115 kV Transformer No. 1	P6	N-1/N-1	0.8956	>0.9	>0.9						Explore potential mitigation
CYVL-V-240	CRTNA M 230 kV	P1-2:A3:5:_Delevan-Cortina 230 kV Line and P1-3:A4:17:_Cortina #5 115/60 kV Transformer	P6	N-1/N-1	0.8908	>0.9	>0.9						Explore potential mitigation
CYVL-V-241	CRTNA M 230 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.7044	0.8019						Explore potential mitigation
CYVL-V-242	CRWS LDG 60 kV	P1-2:A12:19:_S539SS-Newman #1 60 kV Line and P1-2:A11:2:_Stanislaus-Melones-Riverbank Jct 115 kV Line	P6	N-1/N-1	0.8989	>0.9	>0.9						Explore potential mitigation
CYVL-V-243	CURTISS 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8268	0.9142	0.9416						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-244	DAVIS 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8847	>0.9	>0.9						Explore potential mitigation
CYVL-V-245	DE SABLA 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	0.8352	>0.9	>0.9						Explore potential mitigation
CYVL-V-246	DEEPWATR 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8838	>0.9	>0.9						Explore potential mitigation
CYVL-V-247	DEL MAR 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8944	0.8975	0.8969						Explore potential mitigation
CYVL-V-248	DIMOND_1 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.3342	0.3357	0.3105						Explore potential mitigation
CYVL-V-249	DIMOND_2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.2956	0.298	0.2725						Explore potential mitigation
CYVL-V-250	DMND SPR 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.2952	0.2976	0.2722						Explore potential mitigation
CYVL-V-251	DRAKE 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.7017	0.8302						Explore potential mitigation
CYVL-V-252	DRHMSW45 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	0.8215	>0.9	>0.9						Explore potential mitigation
CYVL-V-253	DRUM 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.898	0.8027	0.8326						Explore potential mitigation
CYVL-V-254	DTCH FL1 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8534	0.8031	0.8129						Explore potential mitigation
CYVL-V-255	DTCH FL2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.9275	0.8631	0.8781						Explore potential mitigation
CYVL-V-256	DUNNIGAN 60 kV	P1-2:A3:5:_Delevan-Cortina 230 kV Line and P1-3:A4:17:_Cortina #5 115/60 kV Transformer	P6	N-1/N-1	0.8474	>0.9	>0.9						Explore potential mitigation
CYVL-V-257	DUNNIGAN 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.6792	0.8105						Explore potential mitigation
CYVL-V-258	DUNNTAP 60 kV	P1-2:A3:5:_Delevan-Cortina 230 kV Line and P1-3:A4:17:_Cortina #5 115/60 kV Transformer	P6	N-1/N-1	0.8772	>0.9	>0.9						Explore potential mitigation
CYVL-V-259	DUNNTAP 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.716	0.8427						Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-260	E.NICOLS 115 kV	P1-2:A5:35:_East Nicolaus - Rio Oso 115 kV Line and P1-3:A5:11:_East Nicolaus #3 115/60 kV Transformer	P6	N-1/N-1	>0.9	0.8659	0.8624						Explore potential mitigation
CYVL-V-261	ELDORAD 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.3107	0.3134	0.2852						Explore potential mitigation
CYVL-V-262	ENCINAL 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	0.2277	>0.9	>0.9						Explore potential mitigation
CYVL-V-263	ENCL TAP 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	0.2283	>0.9	>0.9						Explore potential mitigation
CYVL-V-264	ENVRO_HY 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8854	0.6908	0.7197						Explore potential mitigation
CYVL-V-265	FLINT 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.5533	0.5504	0.5361						Explore potential mitigation
CYVL-V-266	FRGTNTP1 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8707	>0.9	>0.9						Explore potential mitigation
CYVL-V-267	FROGTOWN 115 kV	P1-2:A11:7:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8706	>0.9	>0.9						Explore potential mitigation
CYVL-V-268	GOLD HLL 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.376	0.3762	0.3528						Explore potential mitigation
CYVL-V-269	GOLDHILL 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.3583	0.3584	0.3367						Explore potential mitigation
CYVL-V-270	GRAEGL 69 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.8929	>0.9						Explore potential mitigation
CYVL-V-271	GRAND IS 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8679	>0.9	>0.9						Explore potential mitigation
CYVL-V-272	GRIDLEY 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	0.3824	>0.9	>0.9						Explore potential mitigation
CYVL-V-273	HALSEY 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.6051	0.6031	0.5863						Explore potential mitigation
CYVL-V-274	HARINTON 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.7063	0.8342						Explore potential mitigation
CYVL-V-275	HAYPRESS 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.9597	0.8157	0.895						Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-276	HERLNG 69 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.8141	>0.9						Explore potential mitigation
CYVL-V-277	HGHLAND 115 kV	P1-2:A4:17:_Cortina - Vaca 230 kV Line and P1-2:A3:9:_Delevan-Cortina 230 kV Line	P6	N-1/N-1	>0.9	0.8746	0.9166						Explore potential mitigation
CYVL-V-278	HIGGINS 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.6477	0.6335	0.6256						Explore potential mitigation
CYVL-V-279	HOMEGRND 115 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.8808	0.9214						Explore potential mitigation
CYVL-V-280	HOMSTKTP 115 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.8846	0.925						Explore potential mitigation
CYVL-V-281	HORSESHE 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.4203	0.4193	0.3987						Explore potential mitigation
CYVL-V-282	HUSTD 60 kV	P1-2:A4:17:_Cortina - Vaca 230 kV Line and P1-2:A3:9:_Delevan-Cortina 230 kV Line	P6	N-1/N-1	>0.9	0.7862	0.8972						Explore potential mitigation
CYVL-V-283	INDIN VL 115 kV	P1-2:A4:17:_Cortina - Vaca 230 kV Line and P1-2:A3:9:_Delevan-Cortina 230 kV Line	P6	N-1/N-1	>0.9	0.7912	0.8668						Explore potential mitigation
CYVL-V-284	LAMMERS 115 kV	P1-2:A11:5:_Tesla - Vierra 115 kV Line and P1-2:A11:59:_Schulte - Lammers 115 kV Line	P6	N-1/N-1	0.8945	0.9316	0.9299						Explore potential mitigation
CYVL-V-285	LEAVIT1 69 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.7807	>0.9						Explore potential mitigation
CYVL-V-286	LEAVIT2 69 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.7806	>0.9						Explore potential mitigation
CYVL-V-287	LIMESTNE 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.3527	0.3533	0.3294						Explore potential mitigation
CYVL-V-288	LIVE OAK 60 kV	P1-3:A5:41:_New Pease #5 115/60 kV Transformer and P1-3:A5:9:_Pease #2 115/60 kV Transformer	P6	N-1/N-1	0.2518	>0.9	>0.9						Explore potential mitigation
CYVL-V-289	LUCERNE 115 kV	P1-2:A4:17:_Cortina - Vaca 230 kV Line and P1-2:A3:9:_Delevan-Cortina 230 kV Line	P6	N-1/N-1	>0.9	0.8357	0.8971						Explore potential mitigation
CYVL-V-290	MANTECA 115 kV	P1-2:A11:51:_Tesla - Vierra 115 kV Line and P1-3:A11:19:_Tesla 230/115 kV Transformer No. 3	P6	N-1/N-1	0.8957	>0.9	>0.9						Explore potential mitigation
CYVL-V-291	MAXTAP 60 kV	P1-2:A3:5:_Delevan-Cortina 230 kV Line and P1-3:A4:17:_Cortina #5 115/60 kV Transformer	P6	N-1/N-1	0.857	>0.9	>0.9						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-292	MAXWELL 60 kV	P1-2:A3:5:_Delevan-Cortina 230 kV Line and P1-3:A4:17:_Cortina #5 115/60 kV Transformer	P6	N-1/N-1	0.8569	>0.9	>0.9						Explore potential mitigation
CYVL-V-293	MEDLIN J 60 kV	P1-2:A12:18:_Q539SS-Q539 60 kV Line and P1-2:A12:17:_Salado-S539SS #1 60 kV Line	P6	N-1/N-1	0.8817	>0.9	>0.9						Explore potential mitigation
CYVL-V-294	MELNS JA 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8633	>0.9	>0.9						Explore potential mitigation
CYVL-V-295	MELNS JB 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8632	>0.9	>0.9						Explore potential mitigation
CYVL-V-296	MELONES 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8477	>0.9	>0.9						Explore potential mitigation
CYVL-V-297	MERIDIAN 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.7103	0.8555						Explore potential mitigation
CYVL-V-298	MERIDJCT 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.7166	0.8608						Explore potential mitigation
CYVL-V-299	MIDDLTWN 115 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.8824	0.9186						Explore potential mitigation
CYVL-V-300	MILFDREG 69 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.806	>0.9						Explore potential mitigation
CYVL-V-301	MILFORD 69 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.8061	>0.9						Explore potential mitigation
CYVL-V-302	MIZOU_T1 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.3308	0.3325	0.3068						Explore potential mitigation
CYVL-V-303	MIZOU_T2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.2958	0.2982	0.2724						Explore potential mitigation
CYVL-V-304	MRYSVLE 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	0.1551	>0.9	>0.9						Explore potential mitigation
CYVL-V-305	MTN_QJCT 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.6052	0.6022	0.586						Explore potential mitigation
CYVL-V-306	MTN_QUAR 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.5996	0.5968	0.5794						Explore potential mitigation
CYVL-V-307	NEWCSTL1 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.5095	0.5071	0.491						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-308	NEWCSTL2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.514	0.5119	0.4962						Explore potential mitigation
CYVL-V-309	OLETA 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.291	0.2916	0.2684						Explore potential mitigation
CYVL-V-310	OXBOW 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8874	0.6908	0.7197						Explore potential mitigation
CYVL-V-311	PEACHTON 60 kV	P1-2:A5:31:_Palermo - Pease 115 kV Line and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	0.8954	>0.9	>0.9						Explore potential mitigation
CYVL-V-312	PEAS RG 60 kV	P1-2:A11:26:_DGC Mariposa Gen - Kelso 230 kV Line and P1-2:A5:31:_Palermo - Pease 115 kV Line	P6	N-1/N-1	0.8901	>0.9	>0.9						Explore potential mitigation
CYVL-V-313	PENRYN 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.5802	0.576	0.5569						Explore potential mitigation
CYVL-V-314	PEORIA 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.841	0.9266	0.954						Explore potential mitigation
CYVL-V-315	PLACER 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.6105	0.607	0.5911						Explore potential mitigation
CYVL-V-316	PLCRVLB2 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.2956	0.2984	0.2718						Explore potential mitigation
CYVL-V-317	PLCRVLB3 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.2954	0.298	0.2718						Explore potential mitigation
CYVL-V-318	PLSNT GR 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.89	0.8924	0.8973						Explore potential mitigation
CYVL-V-319	POST 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8873	>0.9	>0.9						Explore potential mitigation
CYVL-V-320	R.TRACK 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8457	>0.9	>0.9						Explore potential mitigation
CYVL-V-321	RCTRK J. 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8333	>0.9	>0.9						Explore potential mitigation
CYVL-V-322	RIVRBKJT 115 kV	P1-2:A11:59:_Schulte - Lammers 115 kV Line and P1-2:A11:42:_Stanislaus-Melones-Riverbank Jct 115 kV Line	P6	N-1/N-1	0.8975	>0.9	>0.9						Explore potential mitigation
CYVL-V-323	RIVRBKJT 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P6	N-1/N-1	>0.9	0.8906	>0.9						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-324	ROLLINS 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8968	0.7629	0.7934						Explore potential mitigation
CYVL-V-325	SCHMLBCH 115 kV	P1-3:A4:8:_Vaca Dixon 230/115 kV Transformer No. 4 and P1-2:A4:41:_Vaca - Suisun 115 kV Line	P6	N-1/N-1	>0.9	0.9079	0.8985						Explore potential mitigation
CYVL-V-326	SCHULTE 115 kV	P1-2:A11:54:_Tesla - Schulte 115 kV Line No. 1 and P1-2:A11:53:_Tesla - Schulte 115 kV Line No. 2	P6	N-1/N-1	0.8987	>0.9	>0.9						Explore potential mitigation
CYVL-V-327	SHADYGLN 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.89	0.7561	0.7868						Explore potential mitigation
CYVL-V-328	SHPRING1 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.3372	0.3385	0.3138						Explore potential mitigation
CYVL-V-329	SHPRING2 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.3041	0.306	0.2816						Explore potential mitigation
CYVL-V-330	SIERRAPI 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8944	0.8975	0.8969						Explore potential mitigation
CYVL-V-331	SJ COGEN 115 kV	P1-2:A11:49:_Vierra - Tracy - Kasson 115 kV Line and P1-2:A11:5:_Tesla - Vierra 115 kV Line	P6	N-1/N-1	0.8981	0.9358	0.9367						Explore potential mitigation
CYVL-V-332	SPICAMIN 115 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	0.3117	0.3141	0.2866						Explore potential mitigation
CYVL-V-333	STAGG-D 230 kV	P1-2:A11:14:_Stagg 230/60 kV Transformer No. 1 and P1-2:A11:11:_Eight Mile - Stagg 230 kV Line	P6	N-1/N-1	>0.9	>0.9	0.8781						Explore potential mitigation
CYVL-V-334	STAGG-F 230 kV	P1-2:A11:14:_Stagg 230/60 kV Transformer No. 1 and P1-2:A11:11:_Eight Mile - Stagg 230 kV Line	P6	N-1/N-1	>0.9	>0.9	0.8773						Explore potential mitigation
CYVL-V-335	STAGG-H 230 kV	P1-2:A11:14:_Stagg 230/60 kV Transformer No. 1 and P1-2:A11:11:_Eight Mile - Stagg 230 kV Line	P6	N-1/N-1	>0.9	>0.9	0.8769						Explore potential mitigation
CYVL-V-336	STANISLS 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8915	>0.9	>0.9						Explore potential mitigation
CYVL-V-337	SUMMIT 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.8646	>0.9						Explore potential mitigation
CYVL-V-338	TAMARACK 60 kV	P1-3:A5:6:_Goldhill #2 230/115 kV Transformer and P1-3:A5:5:_Goldhill #1 230/115 kV Transformer	P6	N-1/N-1	>0.9	0.8522	0.8952						Explore potential mitigation

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ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)							Potential Mitigation Solutions	
					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-339	TBLE MTN 60 kV	P1-3:A5:9:_Pease #2 115/60 kV Transformer and P1-3:A5:41:_New Pease #5 115/60 kV Transformer	P6	N-1/N-1	0.8054	>0.9	>0.9						Explore potential mitigation
CYVL-V-340	TESLAMTR 115 kV	P1-2:A11:49:_Vierra - Tracy - Kasson 115 kV Line and P1-2:A11:5:_Tesla - Vierra 115 kV Line	P6	N-1/N-1	0.8981	>0.9	>0.9						Explore potential mitigation
CYVL-V-341	TRACY 115 kV	P1-2:A11:5:_Tesla - Vierra 115 kV Line and P1-2:A11:55:_Tesla - Tracy 115 kV Line	P6	N-1/N-1	0.896	>0.9	>0.9						Explore potential mitigation
CYVL-V-342	UCD_TP2 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8847	>0.9	>0.9						Explore potential mitigation
CYVL-V-343	UCDAVSJ1 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8847	>0.9	>0.9						Explore potential mitigation
CYVL-V-344	ULTR-RCK 115 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8985	>0.9	>0.9						Explore potential mitigation
CYVL-V-345	VALLY HM 115 kV	P1-2:A11:7:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P6	N-1/N-1	>0.9	0.8846	>0.9						Explore potential mitigation
CYVL-V-346	VALLY HM 115 kV	P1-2:A11:7:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8726	>0.9	>0.9						Explore potential mitigation
CYVL-V-347	VIERATP1 115 kV	P1-2:A11:49:_Vierra - Tracy - Kasson 115 kV Line and P1-2:A11:5:_Tesla - Vierra 115 kV Line	P6	N-1/N-1	0.8987	0.9364	0.9374						Explore potential mitigation
CYVL-V-348	VIERRA 115 kV	P1-2:A11:49:_Vierra - Tracy - Kasson 115 kV Line and P1-2:A11:5:_Tesla - Vierra 115 kV Line	P6	N-1/N-1	0.8996	>0.9	>0.9						Explore potential mitigation
CYVL-V-349	VLYHMTP1 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A11:46:_Ripon - Manteca 115 kV Line	P6	N-1/N-1	>0.9	0.8847	>0.9						Explore potential mitigation
CYVL-V-350	VLYHMTP1 115 kV	P1-2:A11:65:_Bellota-Riverbank-Melones 115 kV Line and P1-2:A12:10:_Donnells - Curtis 115 kV Line	P6	N-1/N-1	0.8727	>0.9	>0.9						Explore potential mitigation
CYVL-V-351	W.SCRMNO 115 kV	P1-2:4:3:_Brighton - Bellota 230 kV Line and P1-2:A5:13:_Rio Oso - Brighton 230 kV Line	P6	N-1/N-1	0.8878	>0.9	>0.9						Explore potential mitigation
CYVL-V-352	WADHMJCT 60 kV	P1-2:A3:9:_Delevan-Cortina 230 kV Line and P1-2:A4:17:_Cortina - Vaca 230 kV Line	P6	N-1/N-1	>0.9	0.7779	>0.9						Explore potential mitigation
CYVL-V-353	WEMR SWS 60 kV	P1-3:A5:5:_Goldhill #1 230/115 kV Transformer and P1-3:A5:6:_Goldhill #2 230/115 kV Transformer	P6	N-1/N-1	0.8856	0.7438	0.774						Explore potential mitigation
CYVL-V-354	WESTLEY 60 kV	P1-3:A11:19:_Tesla 230/115 kV Transformer No. 3 and P1-2:A11:57:_Tesla - Trust 115 kV Line	P6	N-1/N-1	0.8889	>0.9	>0.9						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A		N/A
CYVL-V-355	WESTLEY 60 kV	P1-3:A11:21: _Manteca 115/60 kV Transformer No. 3 and P1-2:A11:59: _Schulte - Lammers 115 kV Line	P6	N-1/N-1	>0.9	0.8643	0.8594						Explore potential mitigation
CYVL-V-356	WILLIAMS 60 kV	P1-2:A4:17: _Cortina - Vaca 230 kV Line and P1-2:A3:9: _Delevan-Cortina 230 kV Line	P6	N-1/N-1	>0.9	0.7648	0.8964						Explore potential mitigation
CYVL-V-357	WILSONAV 60 kV	P1-2:A3:5: _Delevan-Cortina 230 kV Line and P1-3:A4:17: _Cortina #5 115/60 kV Transformer	P6	N-1/N-1	0.8328	>0.9	>0.9						Explore potential mitigation
CYVL-V-358	WSID 60 kV	P1-3:A11:19: _Tesla 230/115 kV Transformer No. 3 and P1-2:A11:57: _Tesla - Trust 115 kV Line	P6	N-1/N-1	0.8891	>0.9	>0.9						Explore potential mitigation
CYVL-V-359	WSID 60 kV	P1-3:A11:21: _Manteca 115/60 kV Transformer No. 3 and P1-2:A11:59: _Schulte - Lammers 115 kV Line	P6	N-1/N-1	>0.9	0.8645	0.8598						Explore potential mitigation
CYVL-V-360	YBA CTYJ 60 kV	P1-3:A5:41: _New Pease #5 115/60 kV Transformer and P1-3:A5:9: _Pease #2 115/60 kV Transformer	P6	N-1/N-1	0.1667	>0.9	>0.9						Explore potential mitigation
CYVL-V-361	YUBACITY 60 kV	P1-3:A5:41: _New Pease #5 115/60 kV Transformer and P1-3:A5:9: _Pease #2 115/60 kV Transformer	P6	N-1/N-1	0.1535	>0.9	>0.9						Explore potential mitigation
CYVL-V-362	E.NICOLS 115 kV	P7-1:A5:12 _Rio Oso-Nicolaus 115 kV Line & Bogue-Rio Oso 115 kV Line	P7	DCTL	>0.9	0.8701	0.8676						Explore potential mitigation
CYVL-V-363	GWFRACY 115 kV	P7-1:A12:19: _Tesla-Schulte 115 kV Line No. 1 & Tesla-Schulte 115 kV Line No. 2	P7	DCTL	0.8986	>0.9	>0.9						Explore potential mitigation
CYVL-V-364	LAMMERS 115 kV	P7-1:A12:19: _Tesla-Schulte 115 kV Line No. 1 & Tesla-Schulte 115 kV Line No. 2	P7	DCTL	0.8982	>0.9	>0.9						Explore potential mitigation
CYVL-V-365	OI GLASS 115 kV	P7-1:A12:19: _Tesla-Schulte 115 kV Line No. 1 & Tesla-Schulte 115 kV Line No. 2	P7	DCTL	0.8978	>0.9	>0.9						Explore potential mitigation
CYVL-V-366	PEAS RG 60 kV	P7-1:A5:10 _Palermo-Pease 115 kV Line & Palermo-Wyandotte 115 kV Line	P7	DCTL	0.8926	>0.9	>0.9						Explore potential mitigation
CYVL-V-367	PLAINFLD 60 kV	P7-1:A4:12 _Lambie Sw Sta-Birds Landing Sw Sta 230 kV Line & Peabody-Birds Landing Sw Sta 230 kV Line	P7	DCTL	0.8596	>0.9	>0.9						Explore potential mitigation
CYVL-V-368	PLFLDJCT 60 kV	P7-1:A4:12 _Lambie Sw Sta-Birds Landing Sw Sta 230 kV Line & Peabody-Birds Landing Sw Sta 230 kV Line	P7	DCTL	0.8727	>0.9	>0.9						Explore potential mitigation
CYVL-V-369	SCHULTE 115 kV	P7-1:A12:19: _Tesla-Schulte 115 kV Line No. 1 & Tesla-Schulte 115 kV Line No. 2	P7	DCTL	0.8987	>0.9	>0.9						Explore potential mitigation
CYVL-V-370	WESTLEY 60 kV	P7-1:A12:19: _Tesla-Schulte 115 kV Line No. 1 & Tesla-Schulte 115 kV Line No. 2	P7	DCTL	0.8924	>0.9	>0.9						Explore potential mitigation

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					2020 SP Heavy Renewable & Min Gas Gen	2025 Retirement of QF Generations	2025 SP No AAEE	N/A	N/A	N/A	N/A	N/A	
CYVL-V-371	WHEATLND 60 kV	P7-1:A5:12_Rio Oso-Nicolaus 115 kV Line & Bogue-Rio Oso 115 kV Line	P7	DCTL	>0.9	0.8925	0.8939						Explore potential mitigation
CYVL-V-372	WSID 60 kV	P7-1:A12:19:_Tesla-Schulte 115 kV Line No. 1 & Tesla-Schulte 115 kV Line No. 2	P7	DCTL	0.8927	>0.9	>0.9						Explore potential mitigation